# Test Bank for Mathematics with Applications 12th Lial

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Exam

Name_____

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Determine whether the given ordered pair is a solution of the given equation.**

1) $5x + y = 12$; (2, 2) 1) _____
A) Yes B) No

2) $3x + 2y - 25 = 0$; (5, 5) 2) _____
A) No B) Yes

3) $5x - 2y = 31$; (5, 3) 3) _____
A) Yes B) No

4) $x^2 + y^2 - 4x + 8y = -12$; (4, −2) 4) _____
A) No B) Yes

5) $x^2 + y^2 - 4x + 5y = 6$; (4, −1) 5) _____
A) Yes B) No

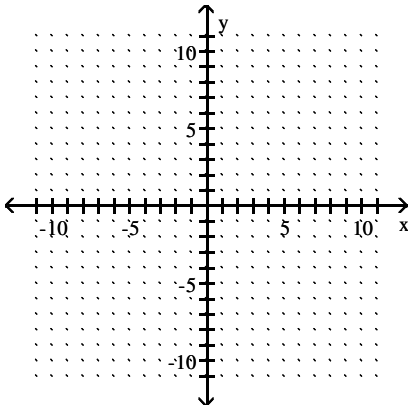
6) $(x - 8)^2 + (y + 3)^2 = 50$; (1, −2) 6) _____
A) No B) Yes

7) $(x - 5)^2 + (y + 4)^2 = -8$; (4, −1) 7) _____
A) No B) Yes

8) $\frac{x^2}{6} + \frac{y^2}{3} = 1$; (1, −1) 8) _____
A) No B) Yes

**Graph the linear equation.**

9) $9y = x + 1$ 9) _____



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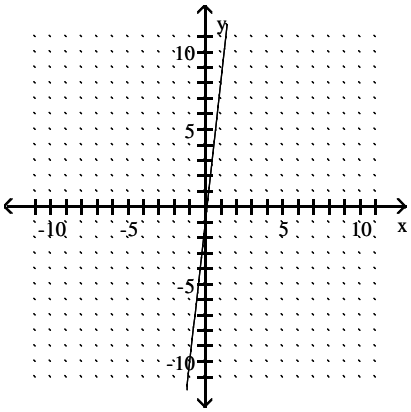


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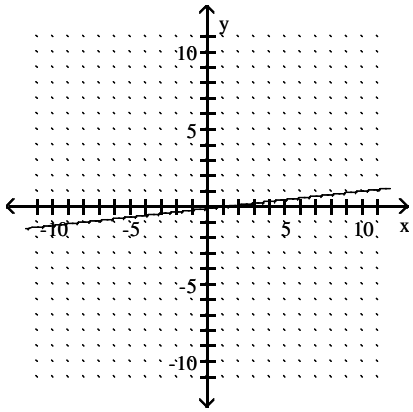


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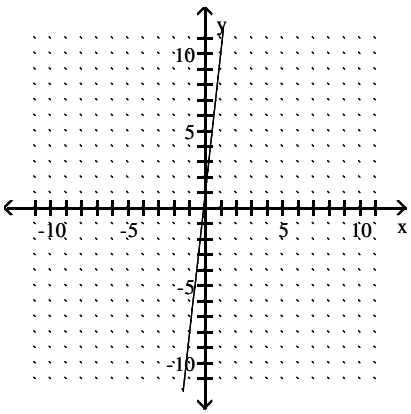


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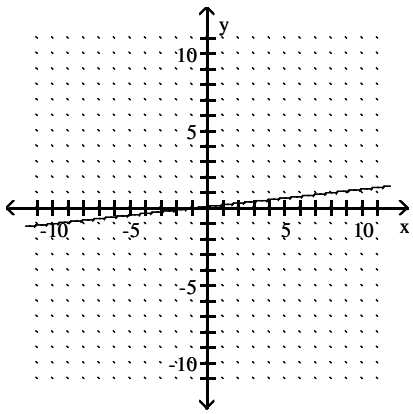




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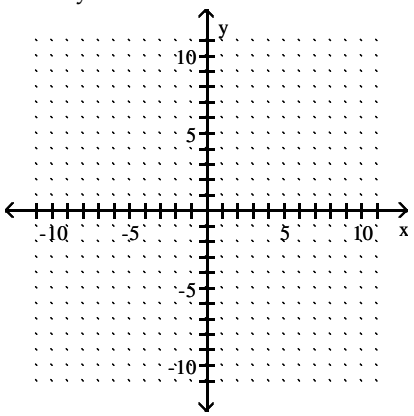
10) $-x = 8y - 8$ 10) _____

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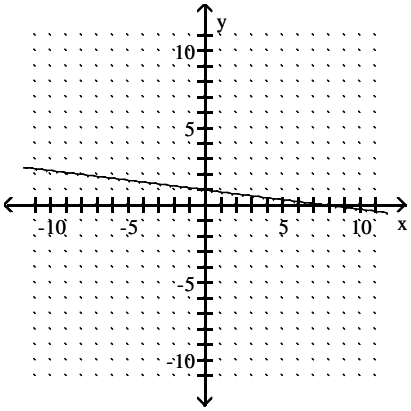


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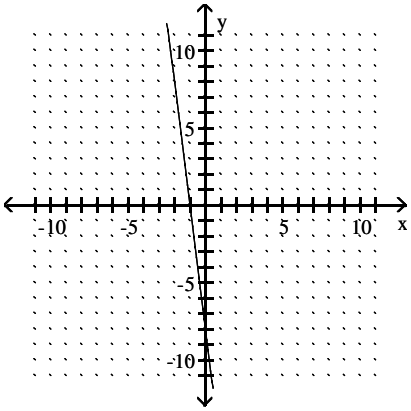


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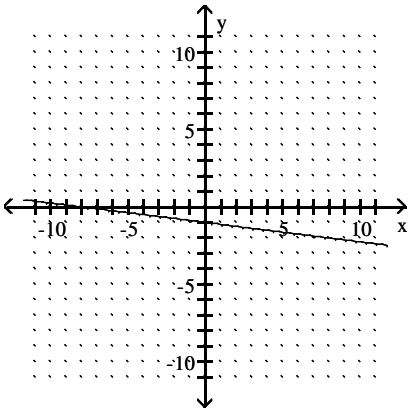


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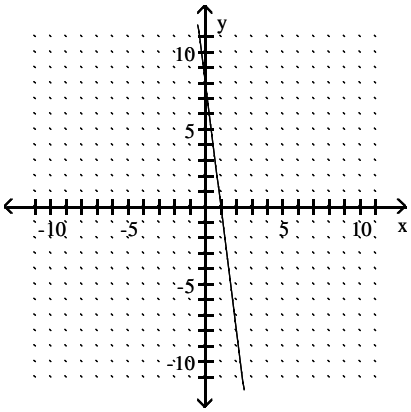




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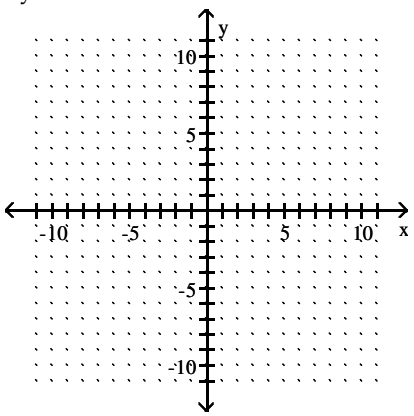
11) $5y - 10x = -45$ 11) _____

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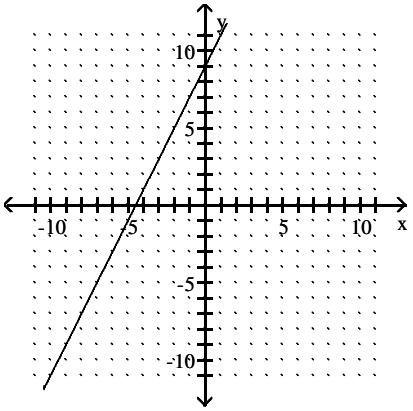


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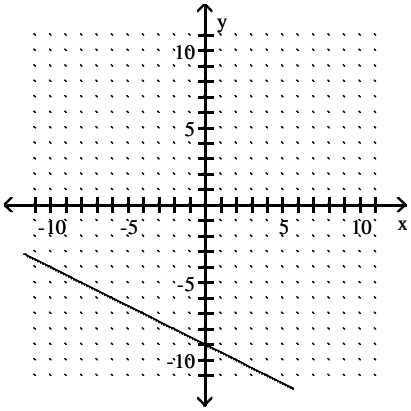


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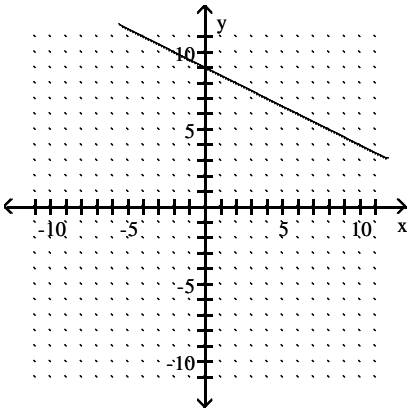


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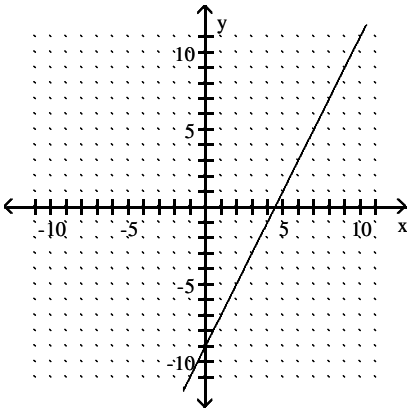




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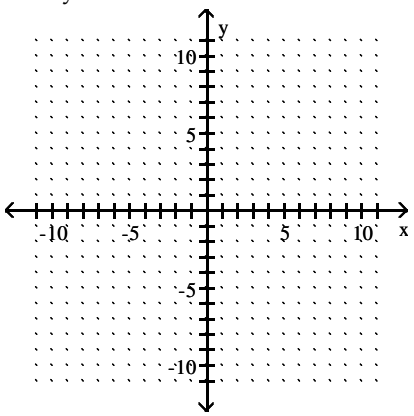
12) $2x = y - 8$ 12) _____

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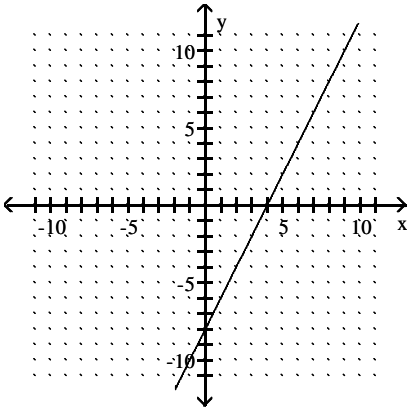


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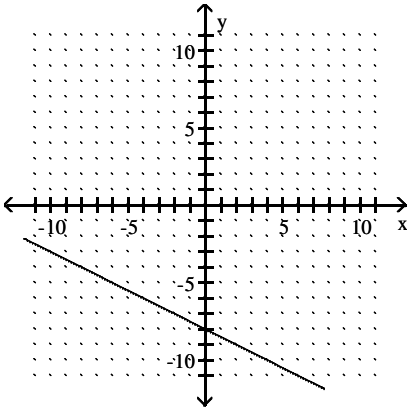


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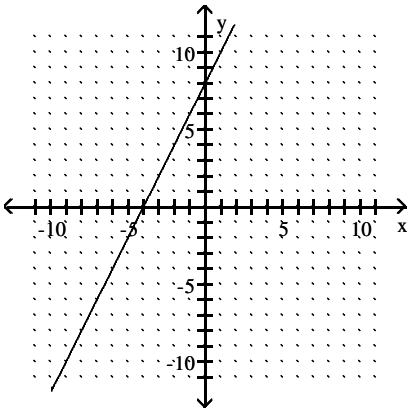


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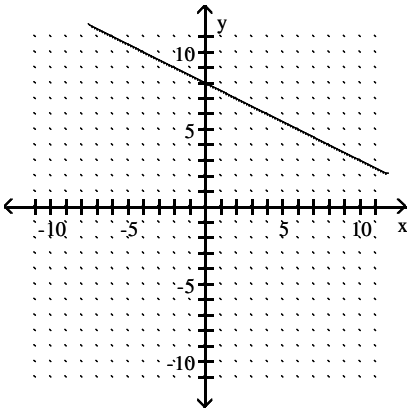




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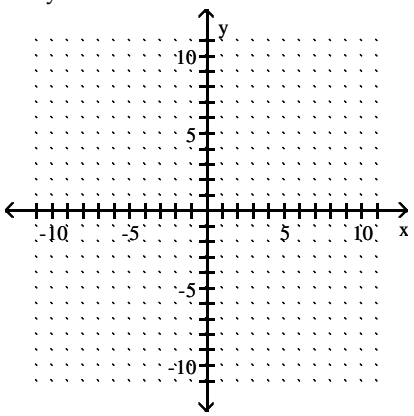
13) $-15y = 3x + 3$ 13) _____

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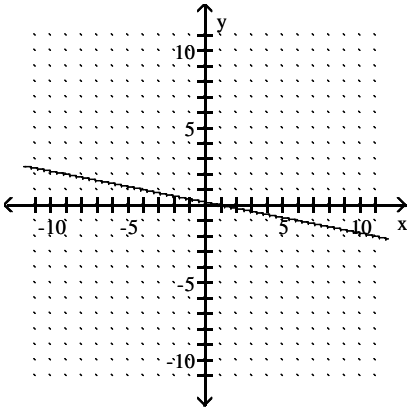


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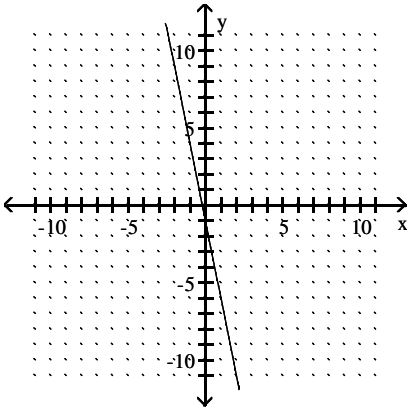


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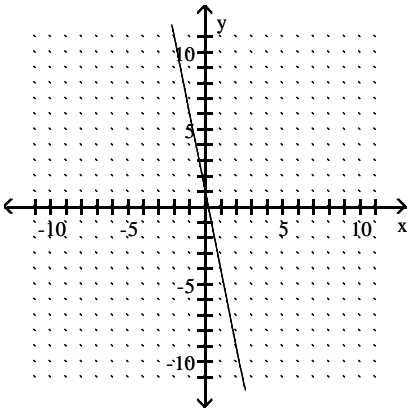


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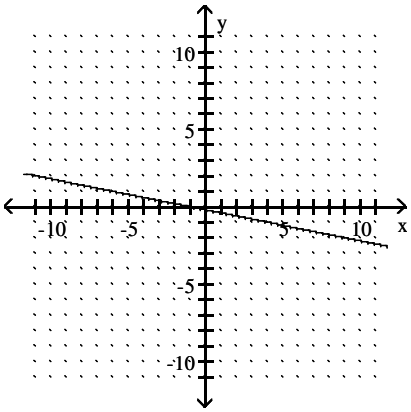




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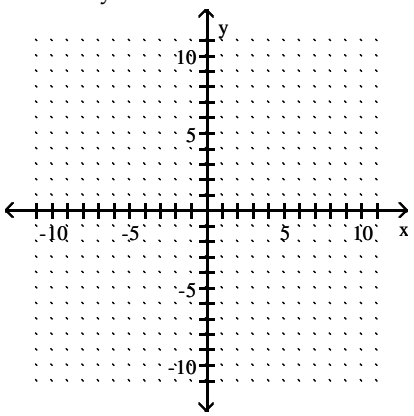
14) $-3x - 27y = 12$ 14) _____

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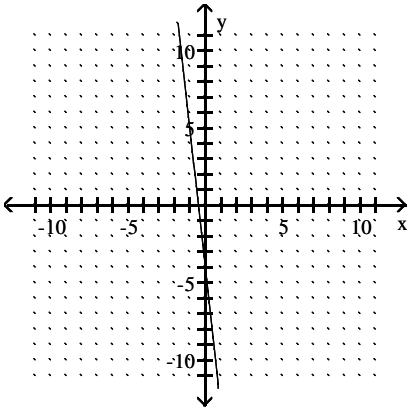


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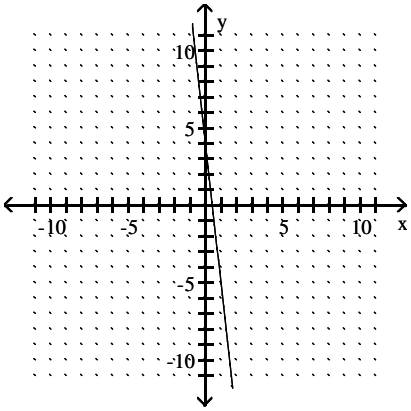


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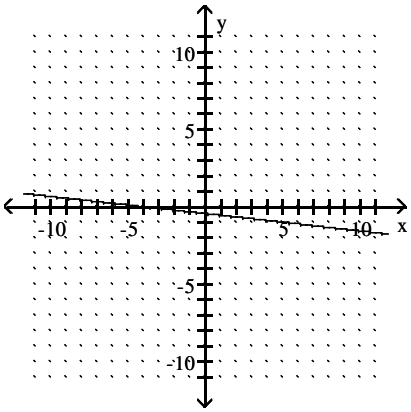


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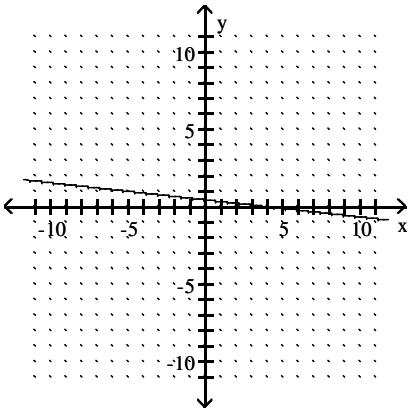




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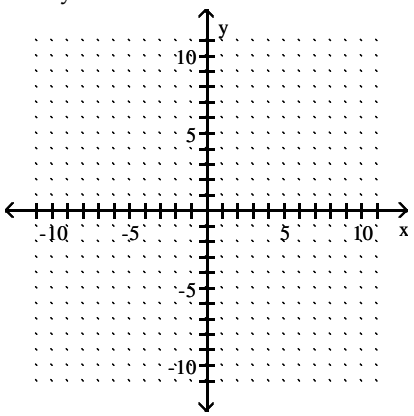
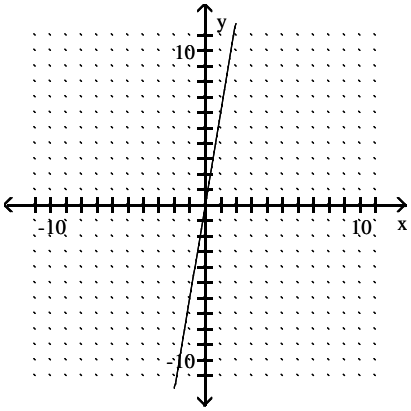
15) $6x - y = 0$ 15) _____




A)

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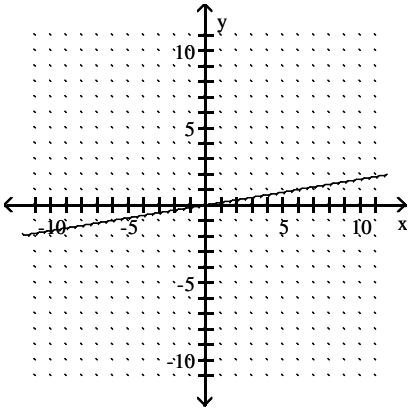


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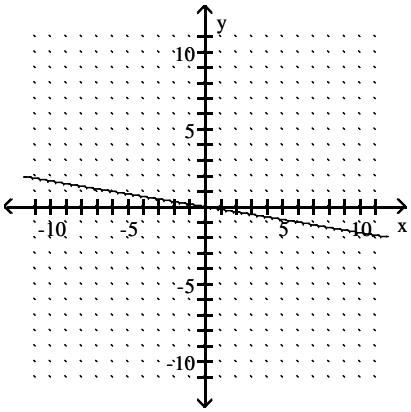


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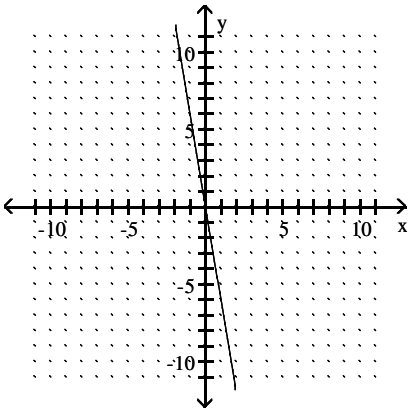




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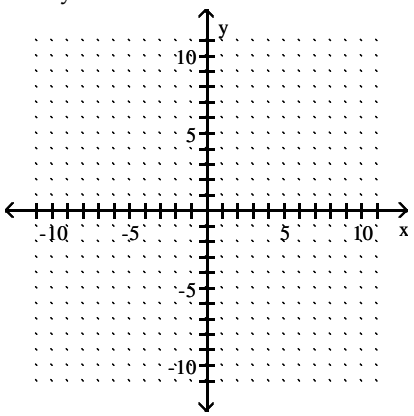
16) $9x + y = 0$ 16) _____

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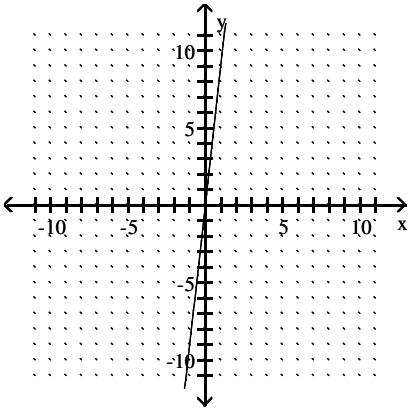


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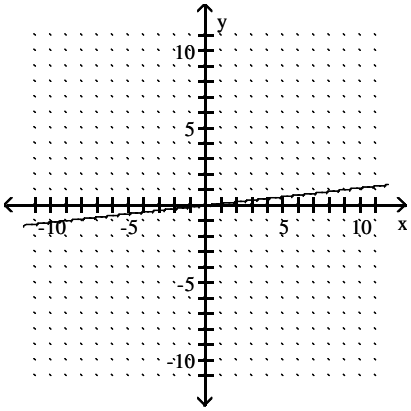


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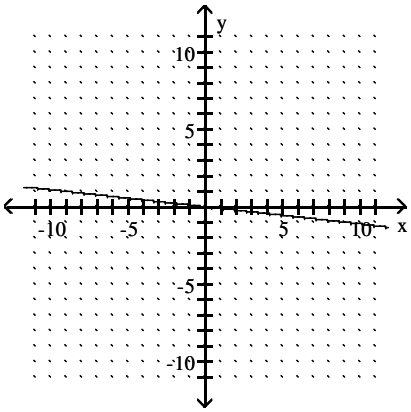


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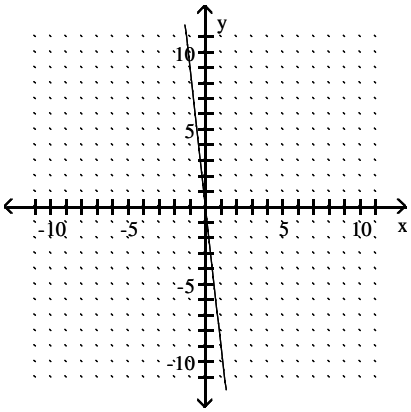




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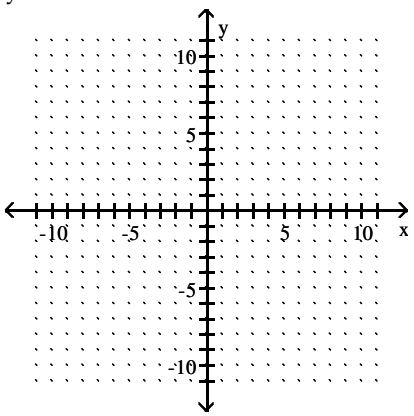
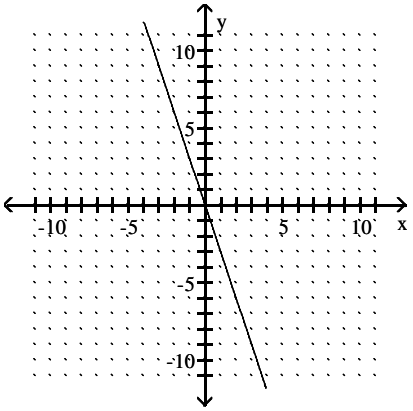
17) $y + 3 = 0$ 17) _____




A)

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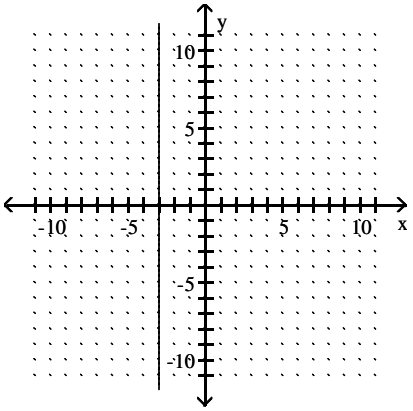


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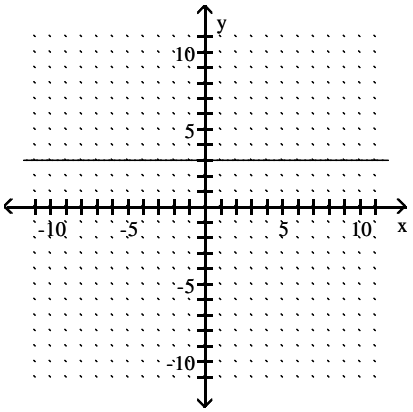


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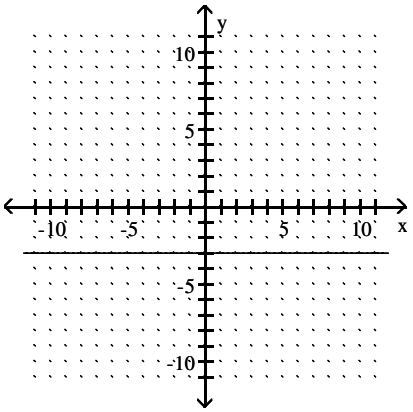




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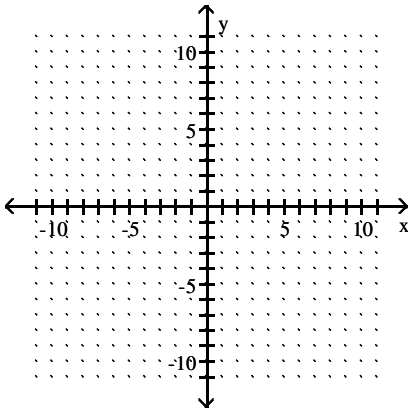
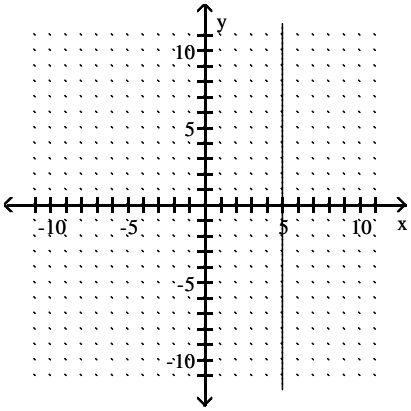
18) x = –5

18) _____




A)

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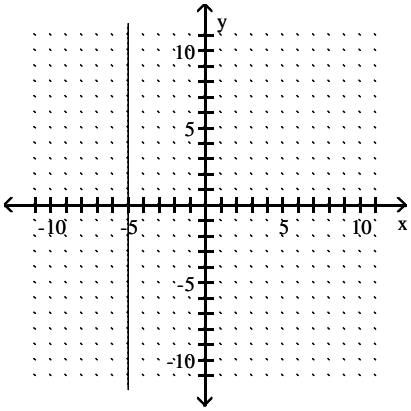


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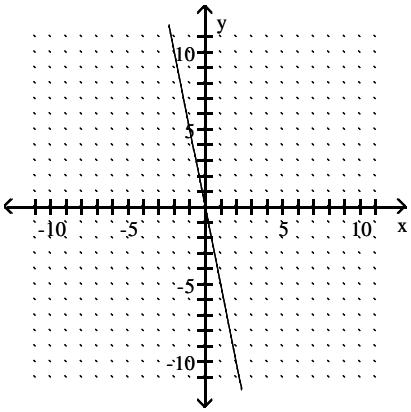


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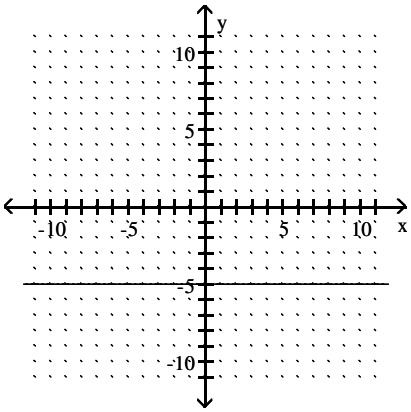




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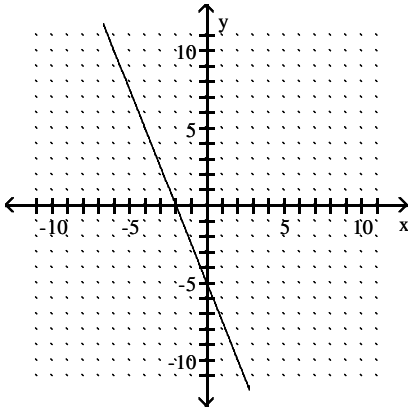
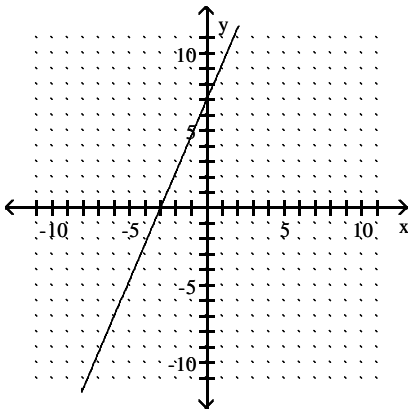
**Give the x–intercepts and y–intercepts of the graph.**

19) 19) _____



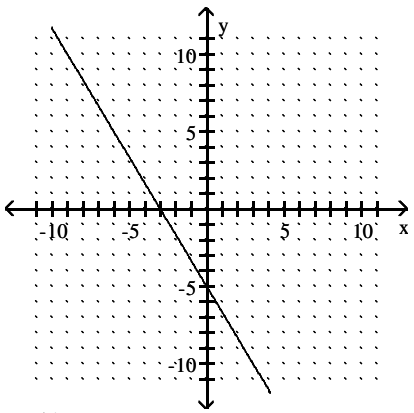

A) x–intercept: –5; y–intercept: –2
B) x–intercept: 5; y–intercept: 2
C) x–intercept: 2; y–intercept: 5
D) x–intercept: –2; y–intercept: –5

20) 20) _____




A) x–intercept: –3; y–intercept: 7
B) x–intercept: –7; y–intercept: 3
C) x–intercept: 7; y–intercept: –3
D) x–intercept: 3; y–intercept: –7

21) 21) _____




A) x–intercept: –3; y–intercept: –5
B) x–intercept: 5; y–intercept: 3
C) x–intercept: 3; y–intercept: 5
D) x–intercept: –5; y–intercept: –3



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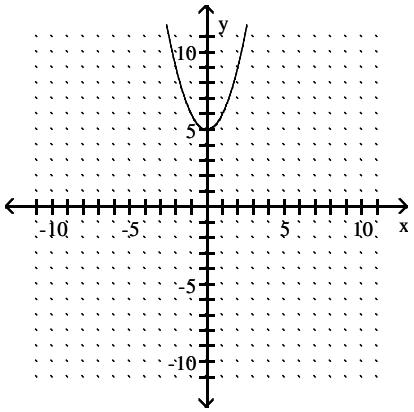
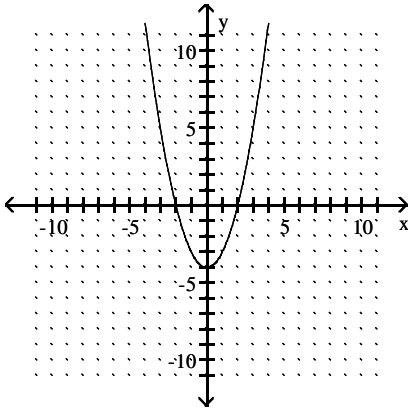
22) 22) _____




A) y–intercept: 5 B) x–intercept: 5 C) x–intercept: –5 D) y–intercept: –5

23) 23) _____




A) x–intercept: –2; y–intercepts: 4 B) x–intercept: 4; y–intercepts: –2, 2
C) x–intercept: 2; y–intercepts: –4 D) x–intercepts: –2, 2; y–intercept: –4

**Find the x–intercepts and y–intercepts of the graph of the equation.**

24) $x + y = 5$ 24) _____

A) x–intercept: 5; y–intercept: 3 B) x–intercept: 5; y–intercept: 5
C) x–intercept: 2; y–intercept: 3 D) x–intercept: 3; y–intercept: 2

25) $x + y = 0$ 25) _____

A) x–intercept: –1; y–intercept: 1 B) x–intercept: 1; y–intercept: –1
C) x–intercept: 0; y–intercept: 0 D) x–intercept: 0; y–intercept: –1

26) $2x + y = 6$ 26) _____

A) x–intercept: 6; y–intercept: 3 B) x–intercept: –6; y–intercept: 6
C) x–intercept: 3; y–intercept: 6 D) x–intercept: 6; y–intercept: –6

27) $4x + y = -8$ 27) _____

A) x–intercept: 8; y–intercept: –4 B) x–intercept: –8; y–intercept: –2
C) x–intercept: –2; y–intercept: –8 D) x–intercept: –4; y–intercept: 8

28) $-2x + y = 0$ 28) _____

A) x–intercept: –8; y–intercept: –4 B) x–intercept: –0; y–intercept: 0
C) x–intercept: –4; y–intercept: –8 D) x–intercept: 0; y–intercept: –0



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29) $-3x + 3y = 9$ 29) _____

A) x–intercept: 3; y–intercept: –3
B) x–intercept: –3; y–intercept: 3
C) x–intercept: –3; y–intercept: –4
D) x–intercept: –4; y–intercept: –3

30) $-4x - 4y = 8$ 30) _____

A) x–intercept: –3; y–intercept: –4
B) x–intercept: –4; y–intercept: –3
C) x–intercept: 2; y–intercept: 2
D) x–intercept: –2; y–intercept: –2

31) $y = x^2 + 1$ 31) _____

A) y–intercept: 0; no x–intercepts
B) x–intercept: 1; no y–intercepts
C) y–intercept: 1; no x–intercepts
D) y–intercept: –1; x–intercept: 1

32) $y = x^2 + 3$ 32) _____

A) y–intercept: 3; x–intercept: 0
B) x–intercept: 3; no y–intercepts
C) y–intercept: 3; no x–intercepts
D) y–intercept: 0; no x–intercepts

33) $y = x^2 - 7$ 33) _____

A) y–intercept: –7; x–intercepts: 0 and $\sqrt{7}$
B) y–intercept: –7; x–intercepts: $\sqrt{7}$ and $-\sqrt{7}$
C) y–intercept: –7; x–intercept: $\sqrt{7}$
D) y–intercept: 7; x–intercepts: $\sqrt{7}$ and $-\sqrt{7}$



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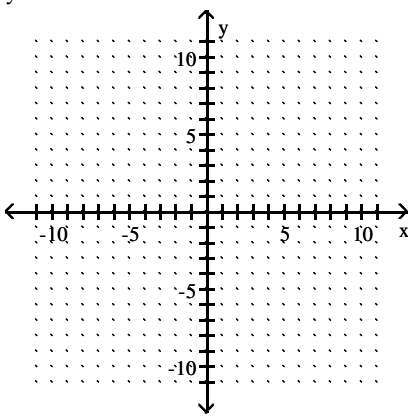
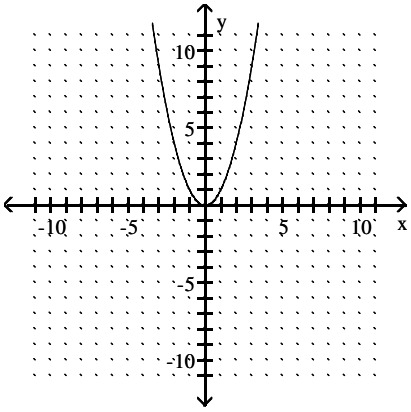
**Sketch the graph of the equation.**

34) $y = 3x^2$ 34) _____




A)

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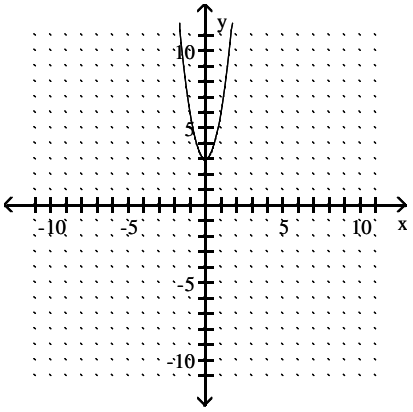


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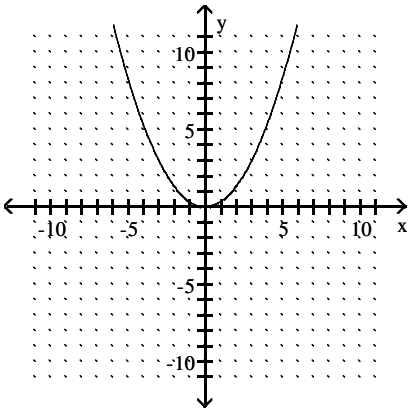
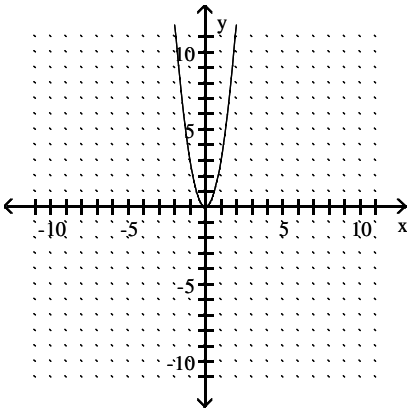



D)



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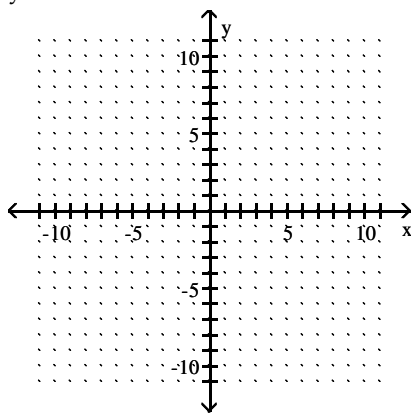
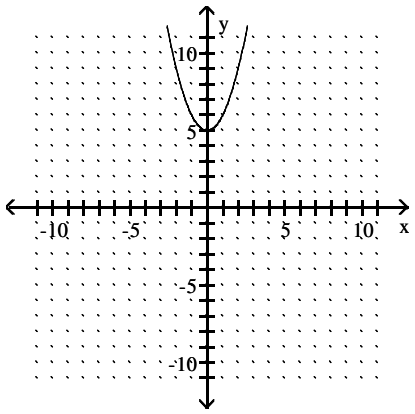
35) $y = x^2 - 5$ 35) _____




A)

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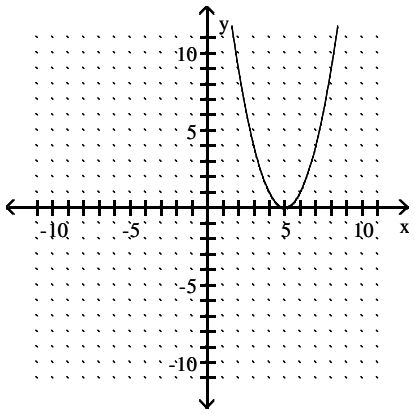
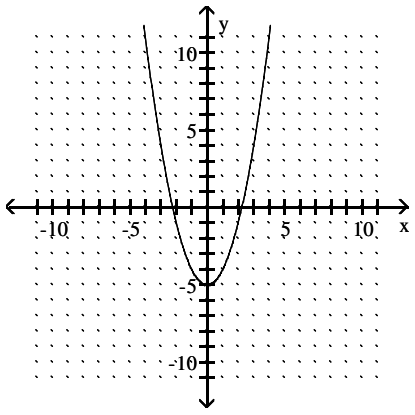



C)

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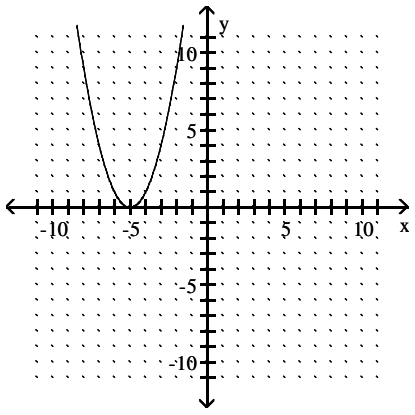




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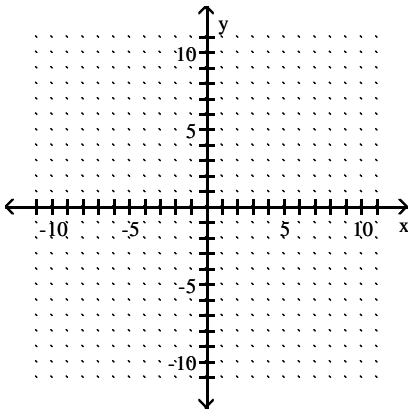
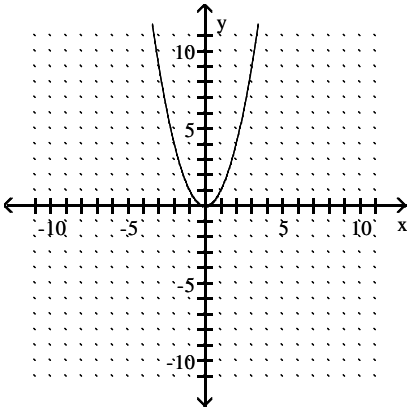
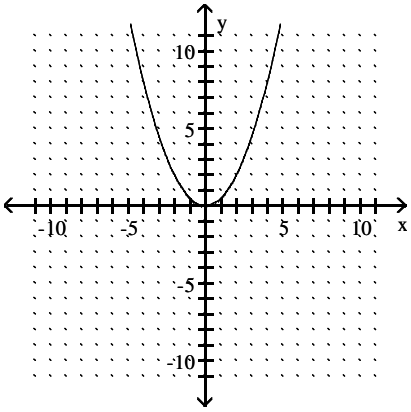
36) $y = \frac{1}{2}x^2$ 36) _____




A)




B)

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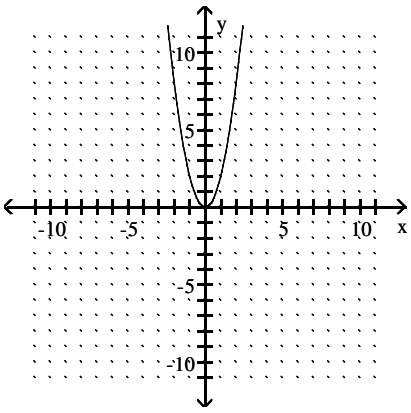


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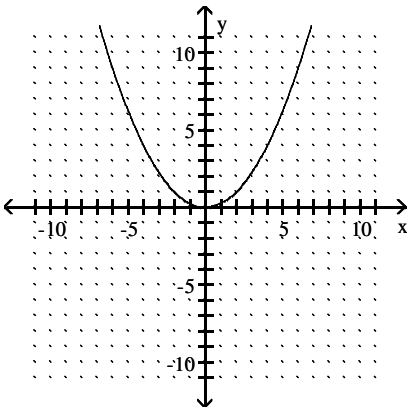




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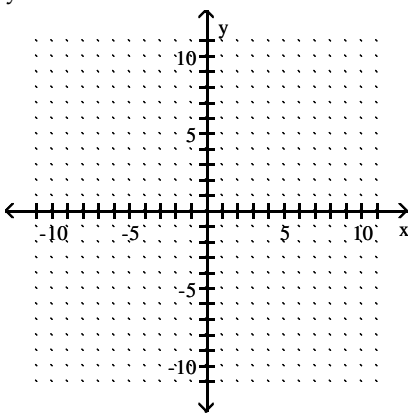
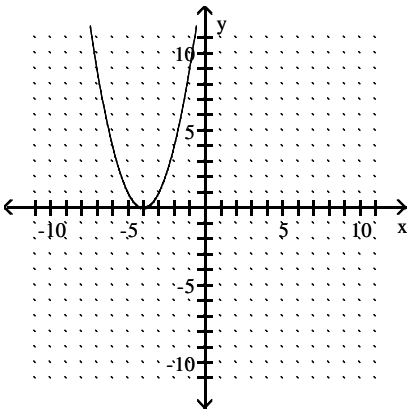
37) $y = -x^2 - 4$ 37) _____




A)

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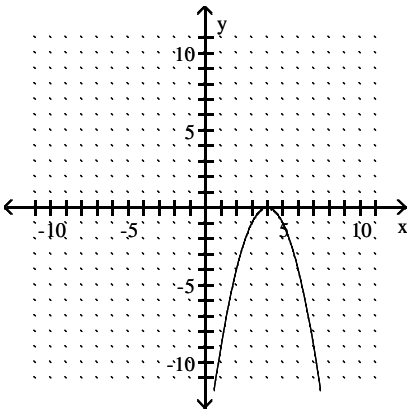


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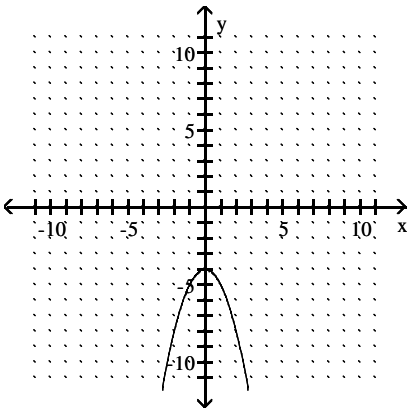


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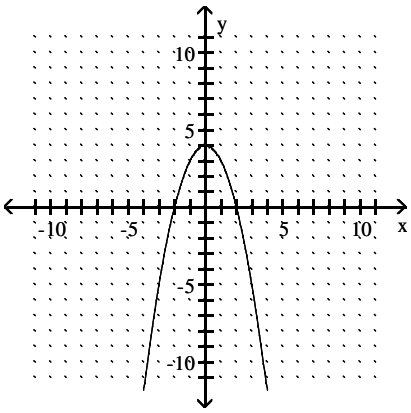




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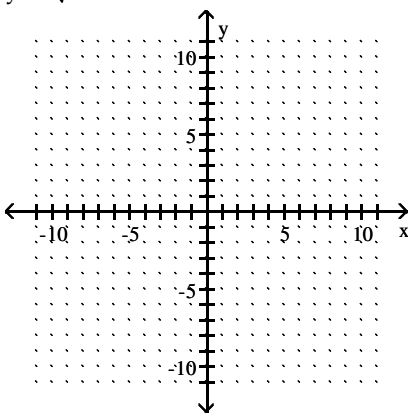
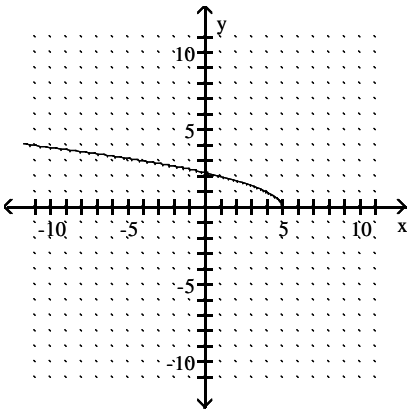
38) $y = \sqrt{x + 5}$ 38) _____




A)

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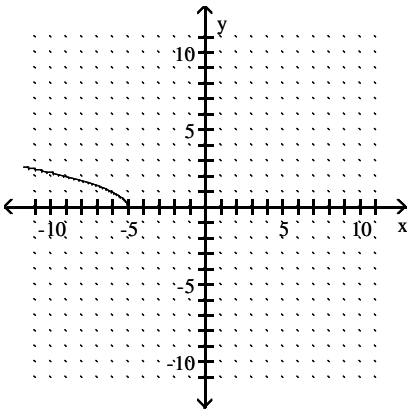


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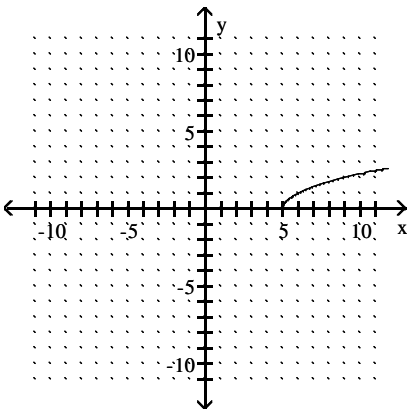


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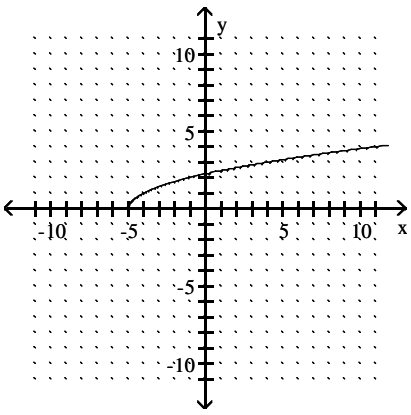
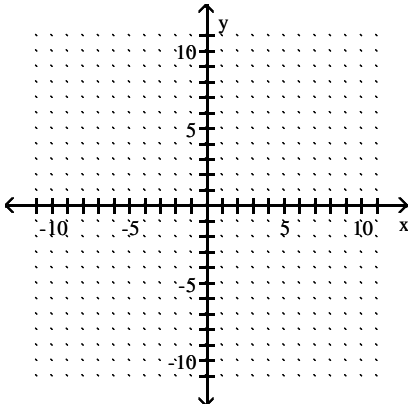



39) $y = -\sqrt{36 - x^2}$ 39) _____



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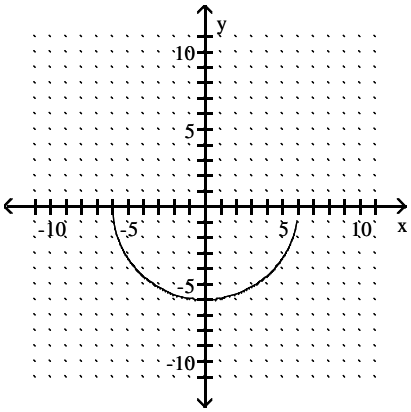
A)

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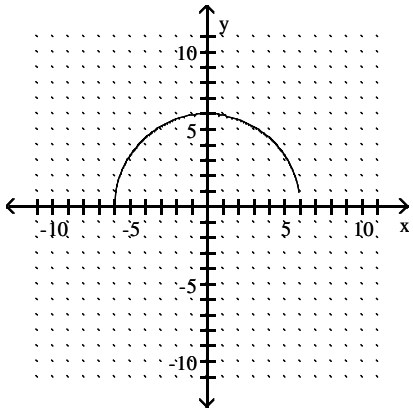


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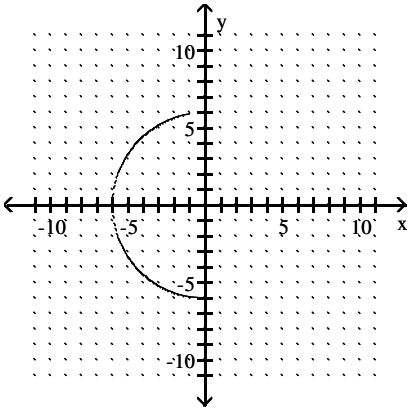


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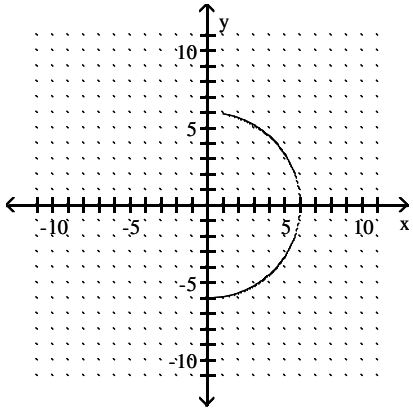




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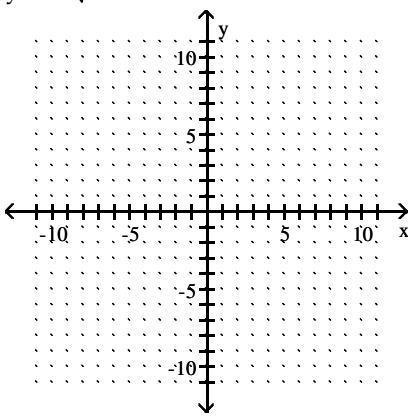
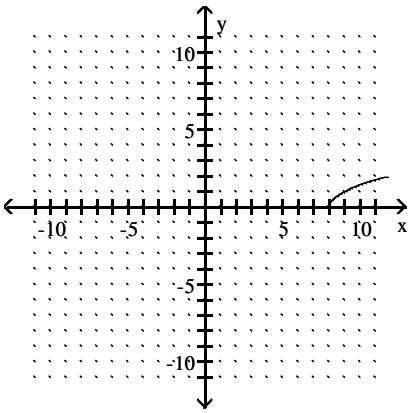
40) $y = -\sqrt{8 - x}$ 40) _____




A)

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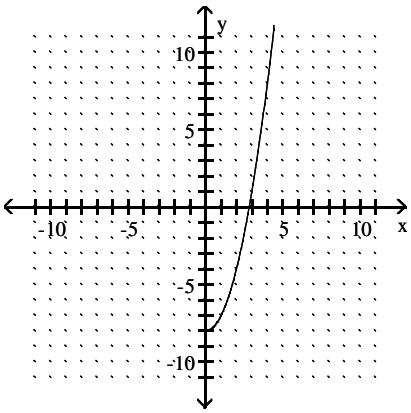


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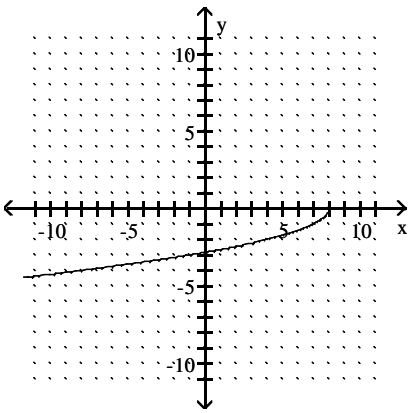


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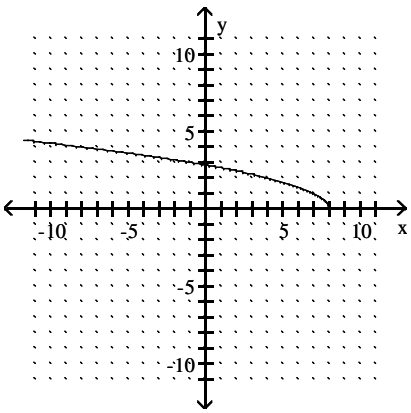
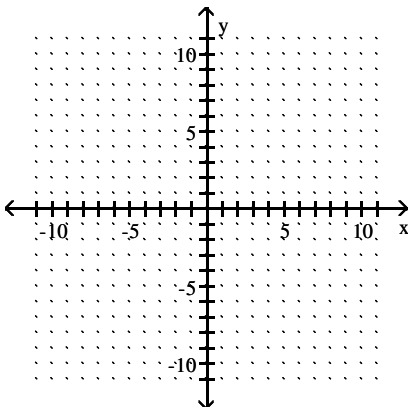



41) $y = \sqrt{16 - x^2}$ 41) _____



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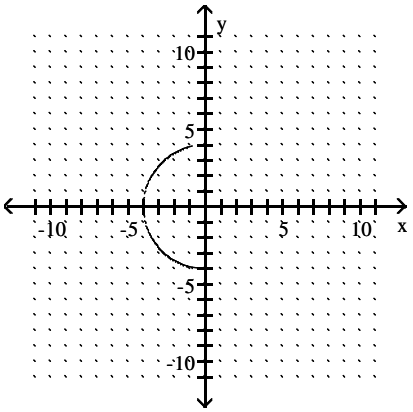
A)

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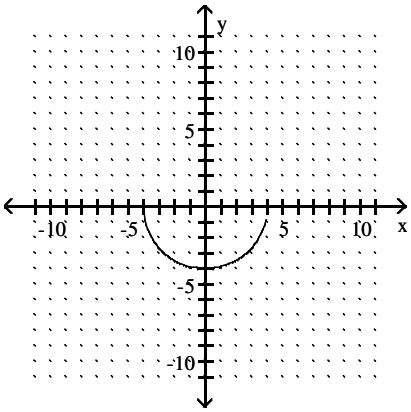


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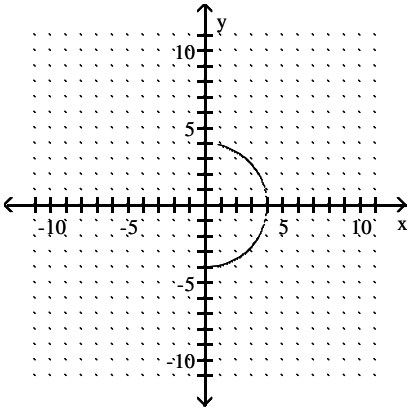


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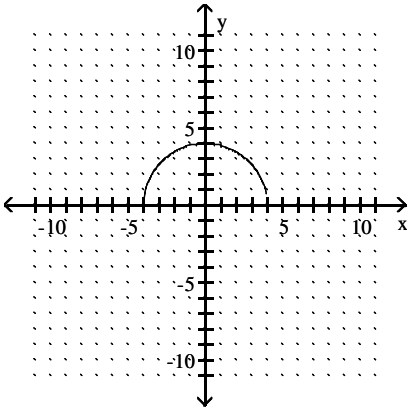
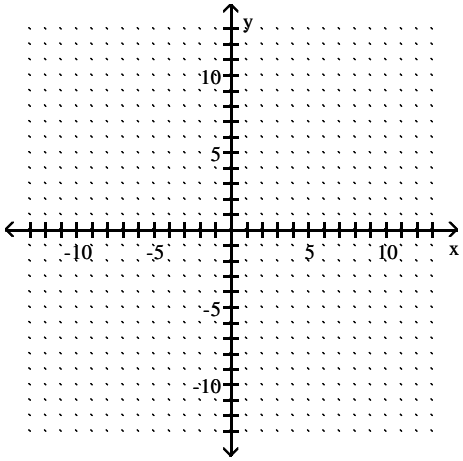



42) $y = \frac{1}{3}x^3 - 3$

42) _____



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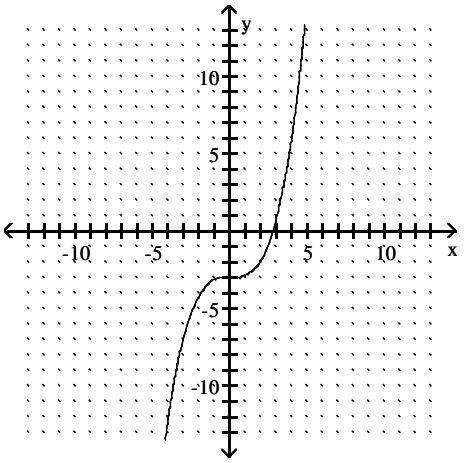
A)

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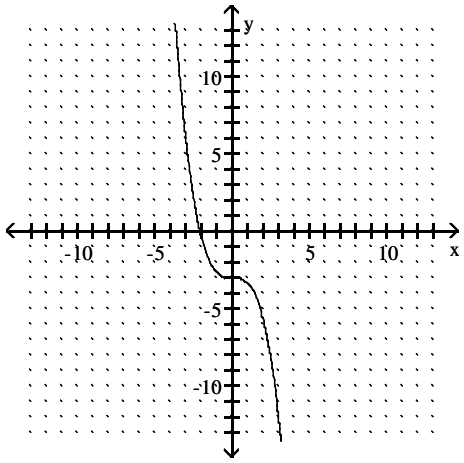


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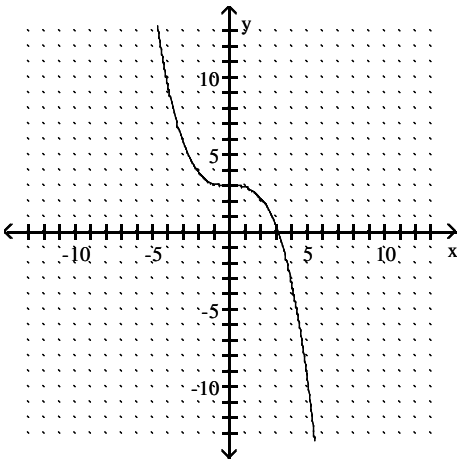
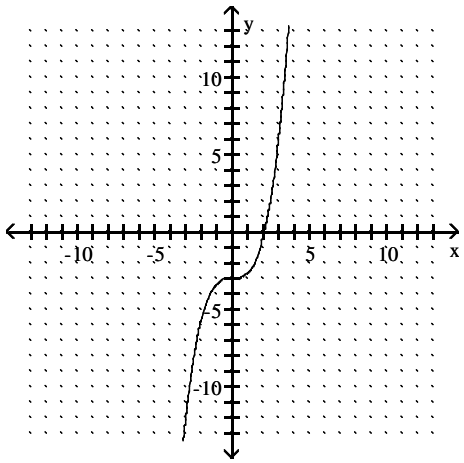



D)



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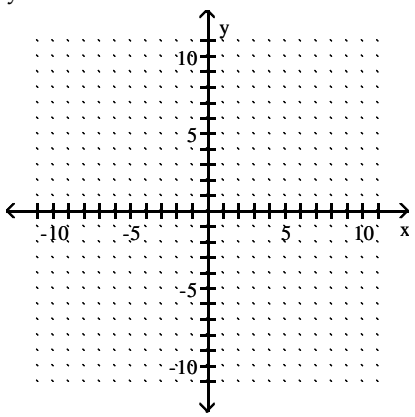
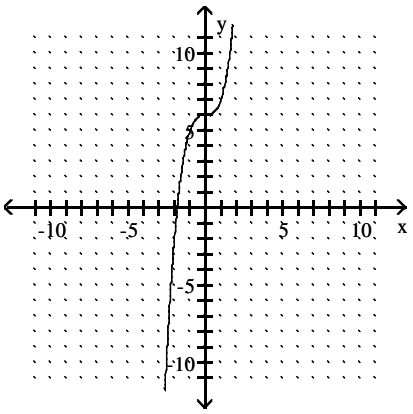
43) $y = x^3 + 6$ 43) _____




A)

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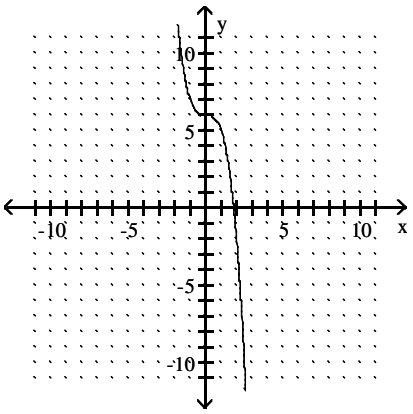


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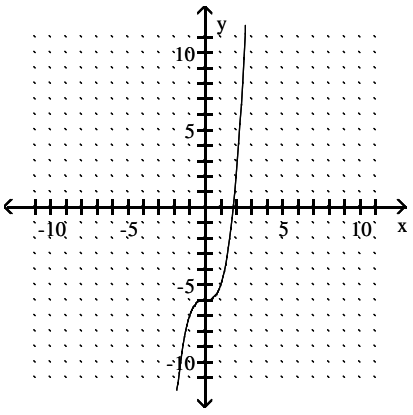
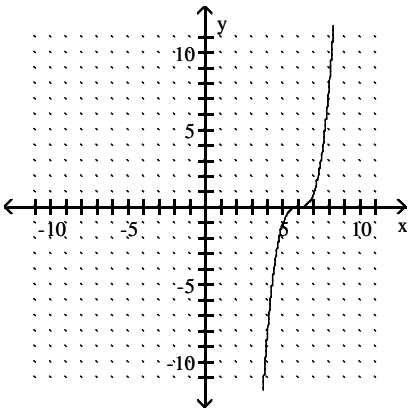



D)




**Use a graphing calculator to find the graph of the equation.**



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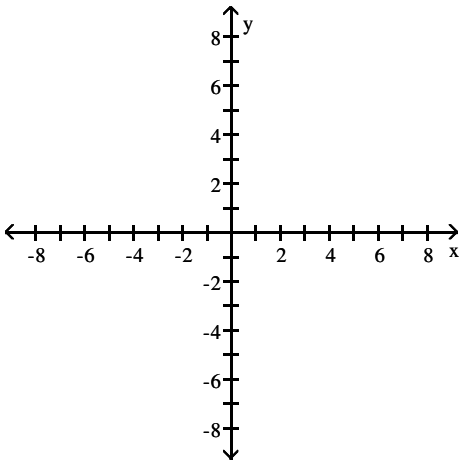
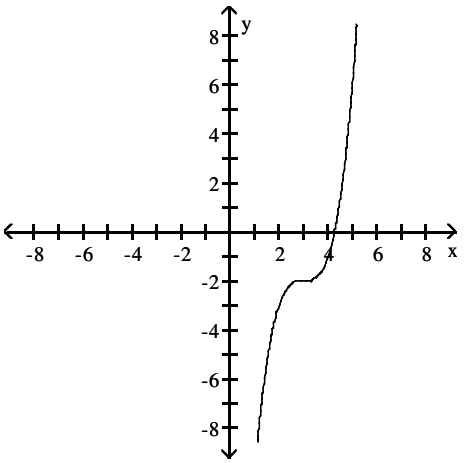
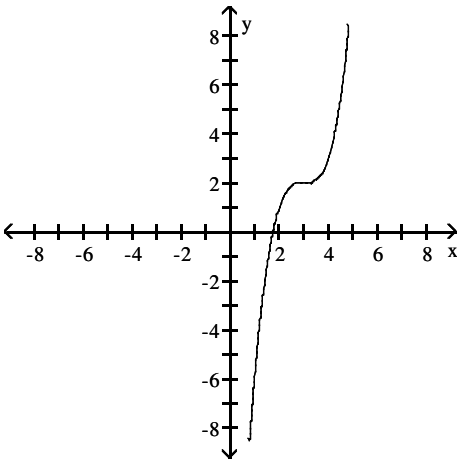
44) $y = (x - 3)^3 - 2$ 44) _____



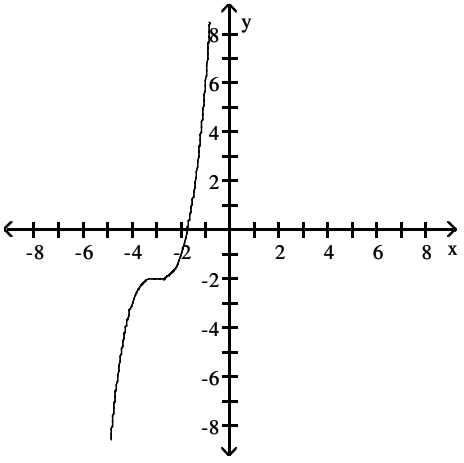

A)



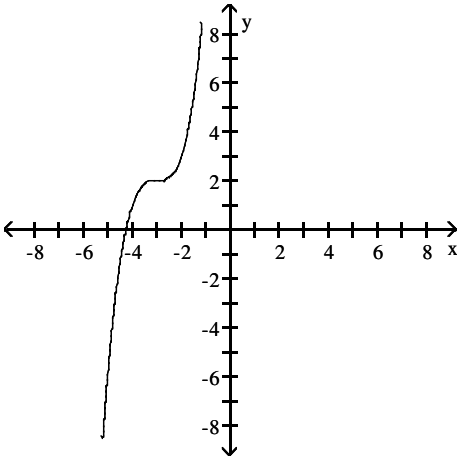

B)




C)




D)



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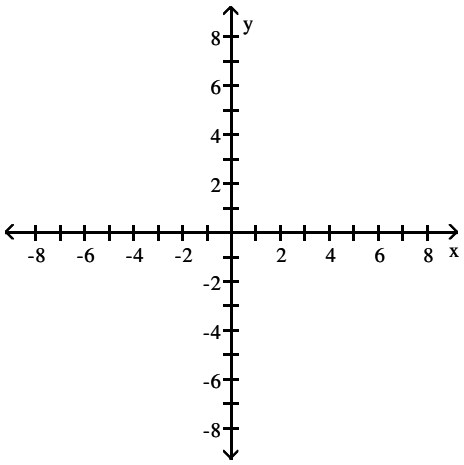
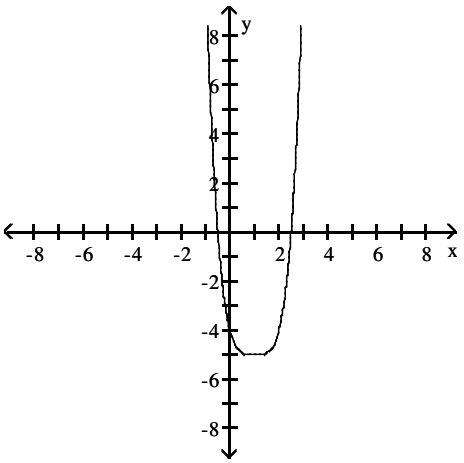
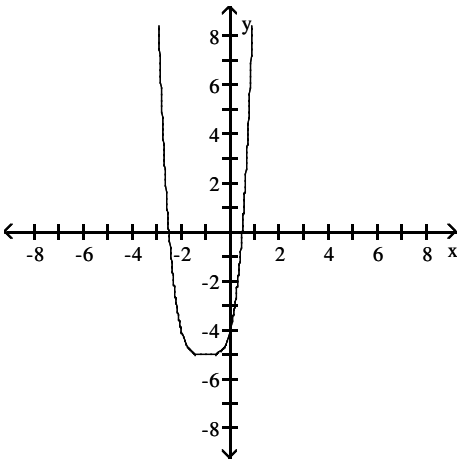
45) $y = -(x - 1)^4 + 5$ 45) _____



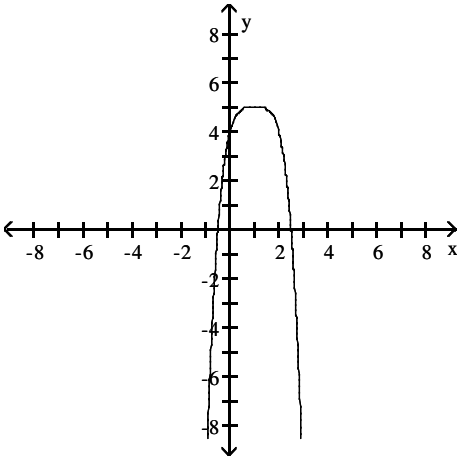

A)




B)




C)

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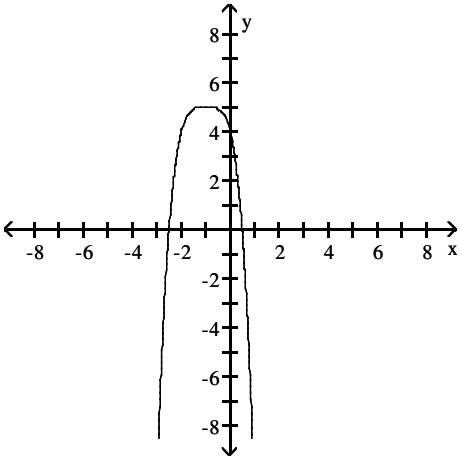




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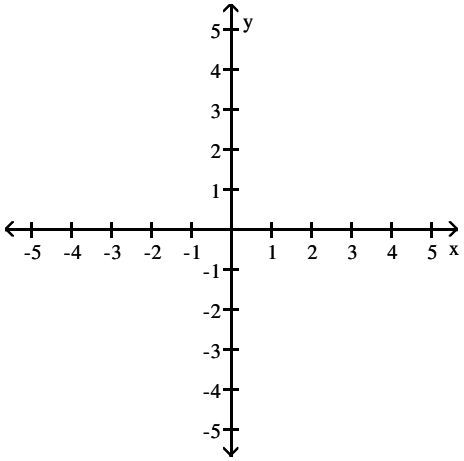
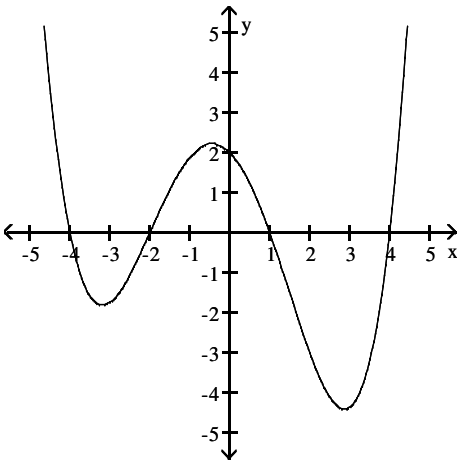
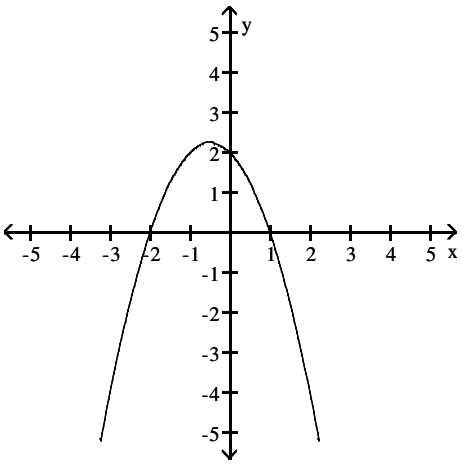
46) $y = x^3 - 3x + 2$ 46) _____




A)




B)

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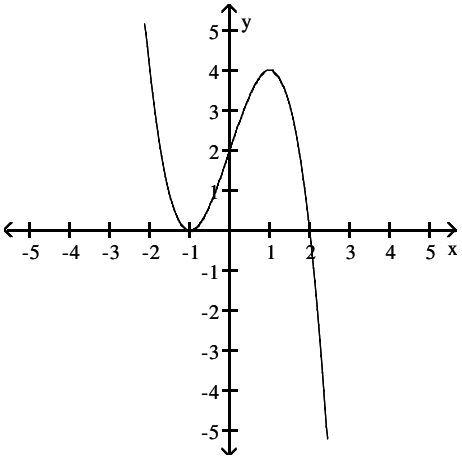
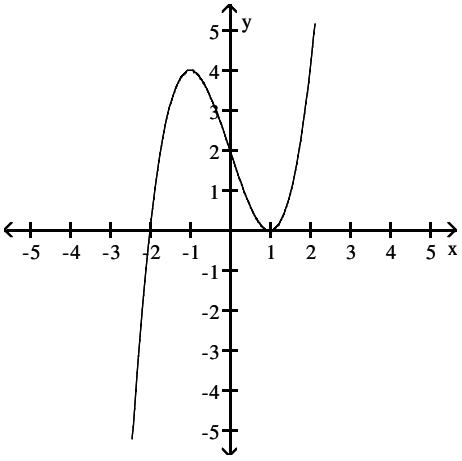



D)



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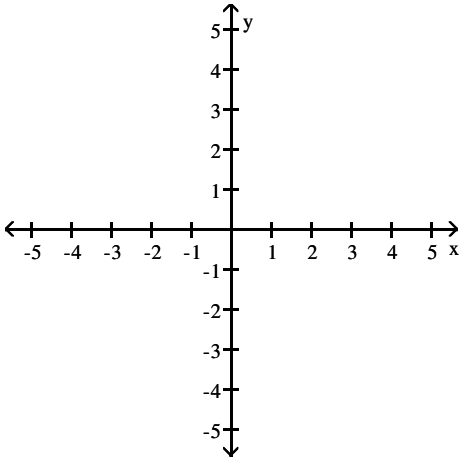
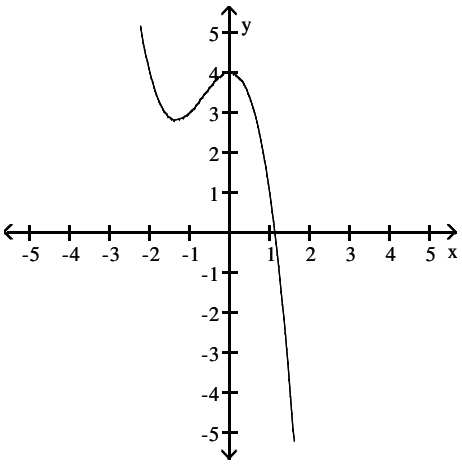
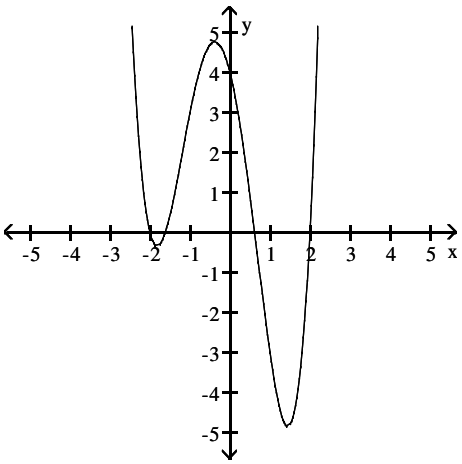
47) $y = x^4 + x^3 - 5x^2 - 4x + 4$ 47) _____



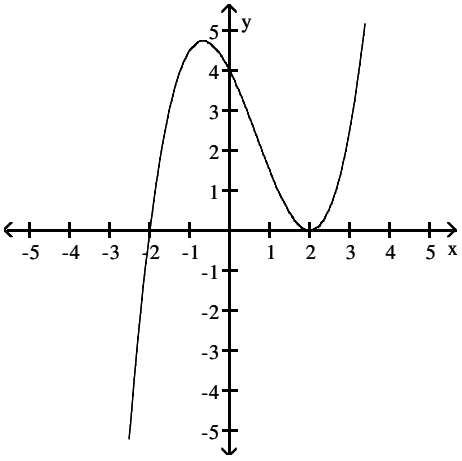

A)



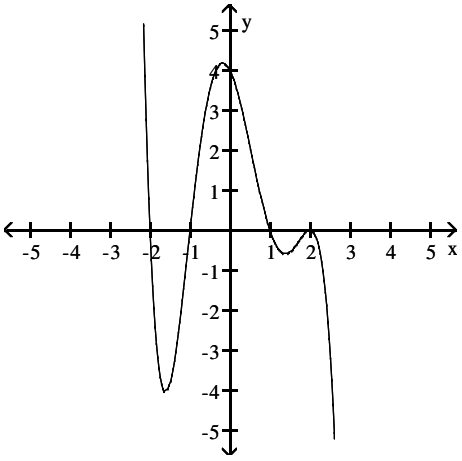

B)




C)




D)




**Use a graphing calculator to approximate all real solutions of the equation.**

48) $y = x^3 - 3x^2 - 25x + 75$ 48) _____

A) –5, 3, 5 B) 25, 3, 75 C) 3 D) –3, 3, 5

49) $y = x^3 - 12x - 16$ 49) _____

A) –4, –2, 2 B) –2, 2, 4 C) 2, –2, 4 D) –2, –2, 4



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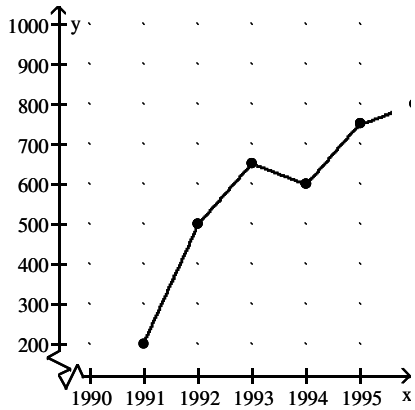
50) $y = x^4 + 9x^3 + 17x^2 - 9x - 18$ 50) _____

A) –1, 1, 3, 6 B) –3, –1, 1, 6 C) –6, –3, 1, 1 D) –6, –3, –1, 1

**Solve the problem.**

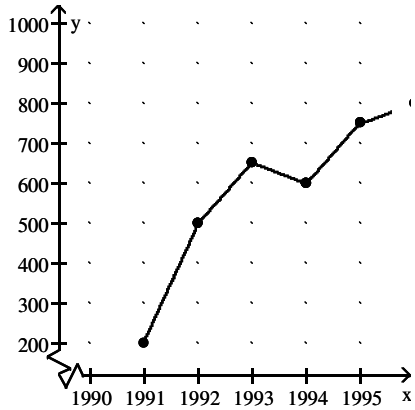
51) 51) _____




Crafty Bill's Cool Car Sales opened as a used car sales lot in 1991. The graph shows the number of ca as a function of time. What is the approximate number of cars sold in 1993?

A) 600 B) 650 C) 250 D) 500

52) 52) _____




Crafty Bill's Cool Car Sales opened as a used car sales lot in 1991. The graph shows the number of ca as a function of time. What is the approximate number of cars sold in 1995?

A) 750 B) 600 C) 350 D) 700



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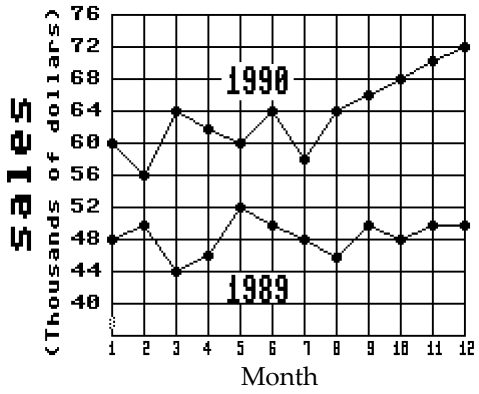
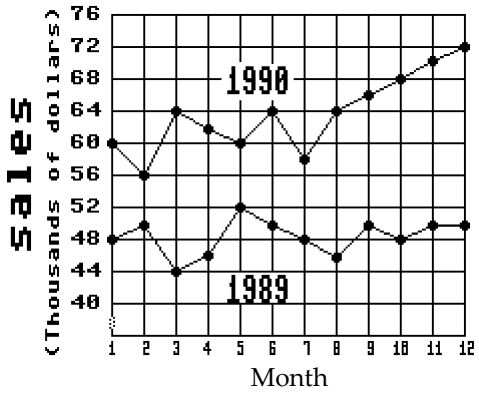
53) Big "D" Sales 1989–1990 53) _____




Which month in 1989 had the lowest sales?

A) Month 8 B) Month 2 C) Month 6 D) Month 3

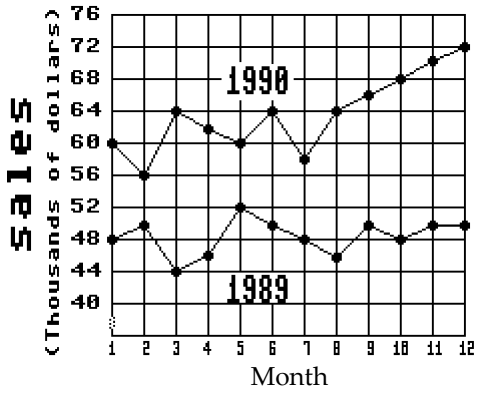
54) Big "D" Sales 1989–1990 54) _____




What was the increase in sales between month 5 and month 6 of 1990?

A) $800 B) $8000 C) $4000 D) $4

55) Big "D" Sales 1989–1990 55) _____




What were the total sales for the first 6 months of 1990?

A) $366,000 B) $64,000 C) $286,000 D) $302,000



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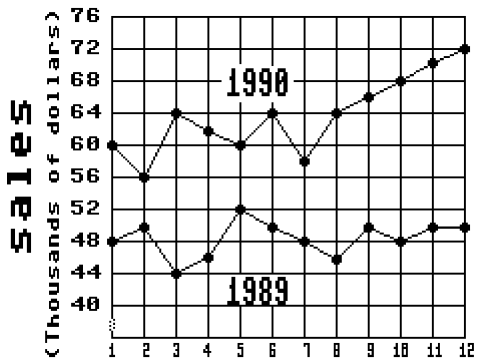
56) Big "D" Sales
1989–1990

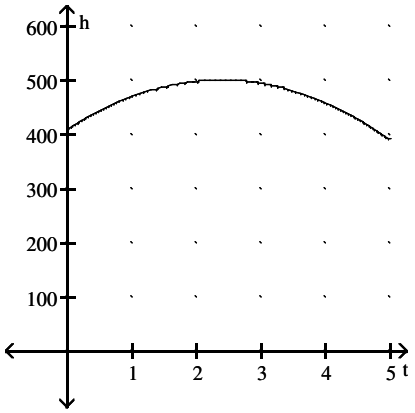



What was the difference between the highest and lowest monthly sales in 1989?

A) $6000 B) $8000 C) $2000 D) $4000

56) _____

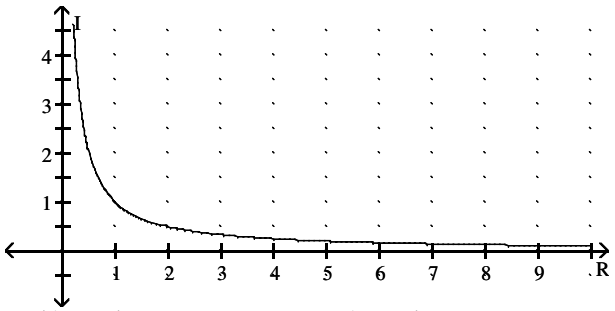
57) The height h in feet of a projectile thrown upward from the roof of a building after time t seconds is shown in the graph below. How high will the projectile be after 0.9 s?




A) 500 ft B) 425 ft C) 450 ft D) 475 ft

57) _____

58) The graph shows the relationship between current I and resistance R if the voltage is fixed. Find the current if the resistance is 2.1 Ω.




A) 0.2 A B) 0.4 A C) 0.6 A D) 0.8 A

58) _____

**Find the slope of the line, if it is defined.**

59) Through (2, –3) and (–3, 7)

A) –2 B) 5 C) 10 D) 2

59) _____



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60) Through (4, –8) and (8, 3) 60) _____

A) Undefined B) $2\frac{3}{4}$ C) $2\frac{4}{3}$ D) –5

61) Through (–2, –7) and (–4, 3) 61) _____

A) Undefined B) 10 C) –2 D) –5

62) Through (1, –9) and (8, 8) 62) _____

A) 1 B) Undefined C) $-2\frac{3}{7}$ D) $2\frac{3}{7}$

63) Through (–5, –6) and (–5, 6) 63) _____

A) 6 B) Undefined C) 12 D) 2

64) Through (1, 5) and (5, 5) 64) _____

A) 7 B) 1 C) 3 D) 0

65) Through the origin and (2, –6) 65) _____

A) 2 B) –3 C) 3 D) –6

66) Through the origin and (3, 5) 66) _____

A) $1\frac{3}{2}$ B) Undefined C) $1\frac{2}{3}$ D) 5

**Write an equation in slope–intercept form of a line satisfying the given conditions.**

67) $m = -\frac{3}{7}; b = \frac{20}{7}$ 67) _____

A) $y = \frac{3}{7}x - \frac{20}{7}$ B) $y = -\frac{3}{7}x - \frac{20}{7}$ C) $y = -\frac{3}{7}x + \frac{20}{7}$ D) $y = \frac{3}{7}x + \frac{20}{7}$

68) $m = -\frac{3}{4}; b = 5$ 68) _____

A) $y = \frac{3}{4}x + 5$ B) $y = -\frac{3}{4}x + 5$ C) $y = \frac{3}{4}x - 5$ D) $y = -\frac{3}{4}x - 5$

69) $m = \frac{5}{2}; b = -2$ 69) _____

A) $y = -\frac{5}{2}x + 2$ B) $y = -\frac{5}{2}x - 2$ C) $y = \frac{5}{2}x - 2$ D) $y = \frac{5}{2}x + 2$

70) $m = \frac{1}{3}; b = 4$ 70) _____

A) $y = \frac{1}{3}x - 4$ B) $y = \frac{1}{3}x + 4$ C) $y = -\frac{1}{3}x - 4$ D) $y = -\frac{1}{3}x + 4$



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71) $m = \frac{7}{3}; b = -3$ 71) _____

A) $y = -\frac{7}{3}x + 3$ B) $y = \frac{7}{3}x + 3$ C) $y = \frac{7}{3}x - 3$ D) $y = -\frac{7}{3}x - 3$

72) Slope $-\frac{2}{5}$; y–intercept $\frac{18}{5}$ 72) _____

A) $y = -\frac{2}{5}x - \frac{18}{5}$ B) $y = -\frac{2}{5}x + \frac{18}{5}$ C) $y = \frac{2}{5}x + \frac{18}{5}$ D) $y = \frac{2}{5}x - \frac{18}{5}$

73) Slope $-\frac{3}{4}$; y–intercept $\frac{27}{4}$ 73) _____

A) $y = \frac{3}{4}x + \frac{27}{4}$ B) $y = \frac{3}{4}x - \frac{27}{4}$ C) $y = -\frac{3}{4}x + \frac{27}{4}$ D) $y = -\frac{3}{4}x - \frac{27}{4}$

74) Slope $-\frac{3}{5}$; y–intercept $\frac{7}{5}$ 74) _____

A) $y = -\frac{3}{5}x - \frac{7}{5}$ B) $y = \frac{3}{5}x + \frac{7}{5}$ C) $y = \frac{3}{5}x - \frac{7}{5}$ D) $y = -\frac{3}{5}x + \frac{7}{5}$

75) Slope $-\frac{4}{9}$; y–intercept 3 75) _____

A) $y = \frac{4}{9}x - 3$ B) $y = -\frac{4}{9}x + 3$ C) $y = \frac{4}{9}x + 3$ D) $y = -\frac{4}{9}x - 3$

76) Slope $-\frac{5}{6}$; y–intercept 5 76) _____

A) $y = -\frac{5}{6}x - 5$ B) $y = \frac{5}{6}x - 5$ C) $y = -\frac{5}{6}x + 5$ D) $y = \frac{5}{6}x + 5$

**Find the slope and the y–intercept of the line.**

77) $4x + 5y = 18$ 77) _____

A) $m = -\frac{4}{5}; b = \frac{18}{5}$ B) $m = \frac{5}{4}; b = \frac{18}{5}$

C) $m = \frac{4}{5}; b = 18$ D) $m = -\frac{5}{4}; b = 5$

78) $-5y = -2x - 19$ 78) _____

A) $m = \frac{2}{5}; b = \frac{19}{5}$ B) $m = -\frac{5}{2}; b = -5$

C) $m = -\frac{2}{5}; b = -19$ D) $m = \frac{5}{2}; b = \frac{19}{5}$



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79) $3x - 5y = 29$ 79) _____

A) $m = -\frac{3}{5}; b = 29$

B) $m = \frac{5}{3}; b = -\frac{29}{5}$

C) $m = \frac{3}{5}; b = -\frac{29}{5}$

D) $m = -\frac{5}{3}; b = -5$

80) $2x - 3y = -22$ 80) _____

A) $m = \frac{2}{3}; b = \frac{22}{3}$

B) $m = \frac{3}{2}; b = \frac{22}{3}$

C) $m = -\frac{3}{2}; b = -3$

D) $m = -\frac{2}{3}; b = -22$

81) $y = \frac{9}{5}x$ 81) _____

A) $m = 1; b = 0$ B) $m = 0; b = \frac{9}{5}$ C) $m = \frac{5}{9}; b = \frac{9}{5}$ D) $m = \frac{9}{5}; b = 0$

82) $y = 9x - 8$ 82) _____

A) $m = -9; b = -8$ B) $m = 1; b = 0$ C) $m = 0; b = 8$ D) $m = 9; b = -8$

83) $x + y = -2$ 83) _____

A) $m = 0; b = -1$ B) $m = 1; b = 2$ C) $m = -1; b = -2$ D) $m = -2; b = 0$

84) $x + 3y = -3$ 84) _____

A) $m = \frac{1}{3}; b = -9$

B) $m = -\frac{1}{3}; b = -1$

C) $m = -3; b = 0$

D) $m = 3; b = -9$

85) $4x - 4y = -20$ 85) _____

A) $m = -4; b = -5$ B) $m = 1; b = 5$ C) $m = 1; b = -20$ D) $m = 0; b = 4$

86) $5y + 9x = 4$ 86) _____

A) $m = -9; b = 4$ B) $m = -\frac{9}{5}; b = \frac{4}{5}$ C) $m = 5; b = 0$ D) $m = \frac{9}{5}; b = 0$



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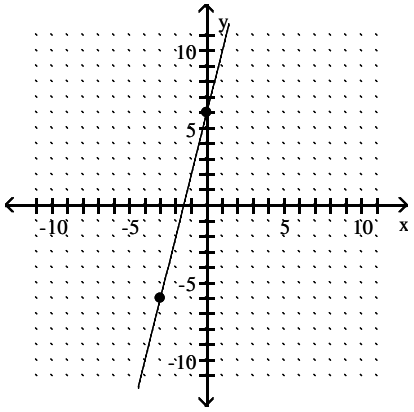
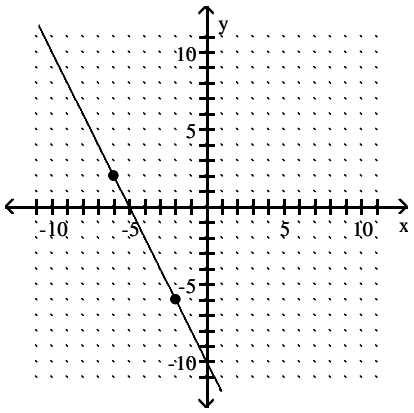
**Identify whether the slope is positive, negative, zero, or undefined.**

87) 87) _____



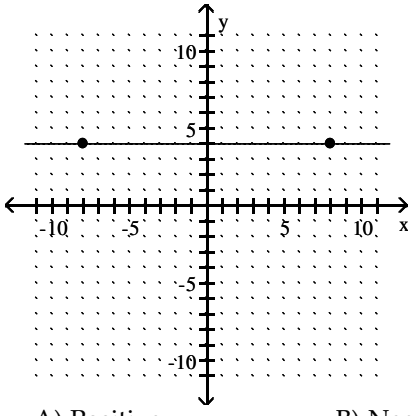

A) Negative B) Zero C) Positive D) Undefined

88) 88) _____




A) Undefined B) Positive C) Negative D) Zero

89) 89) _____




A) Positive B) Negative C) Undefined D) Zero



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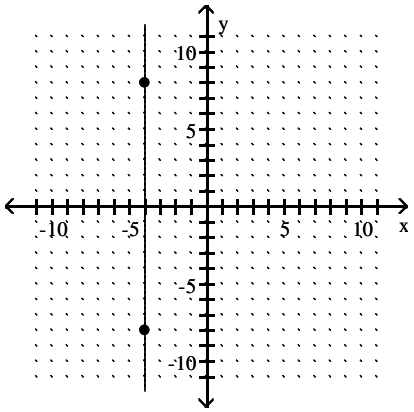
90) 90) _____

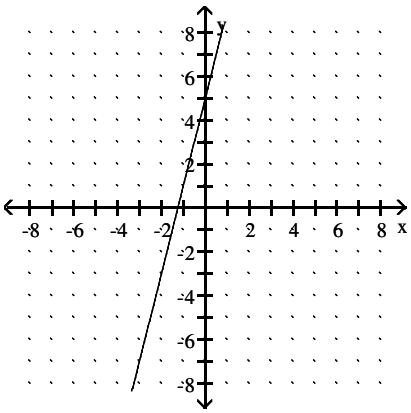



A) Positive B) Zero C) Undefined D) Negative

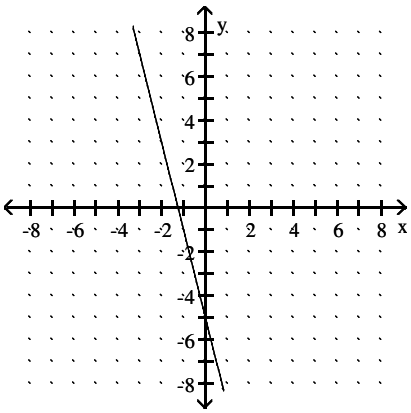
**Choose one of the four lines graphed which most closely resembles the graph of the given equation.**

91) $y = 4x + 5$ 91) _____

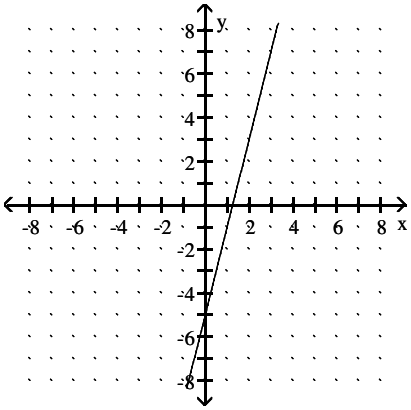
A)



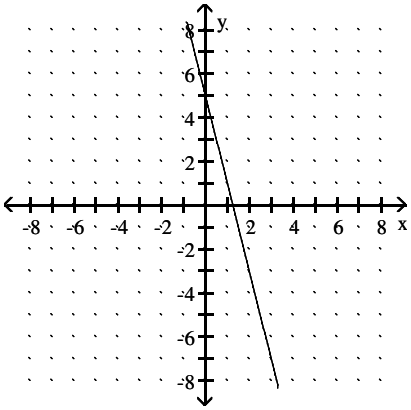

B)




C)




D)



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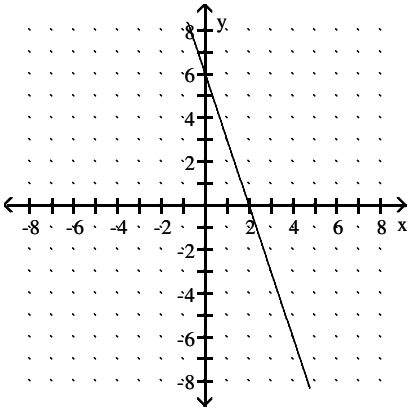
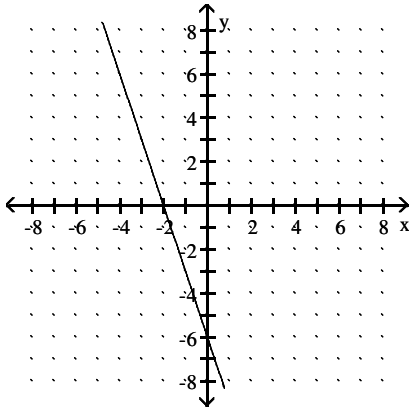
92) $y = 3x - 6$ 92) _____

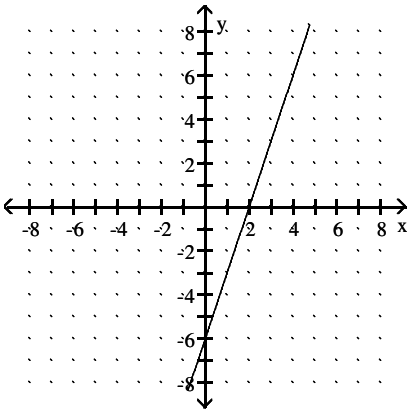
A)



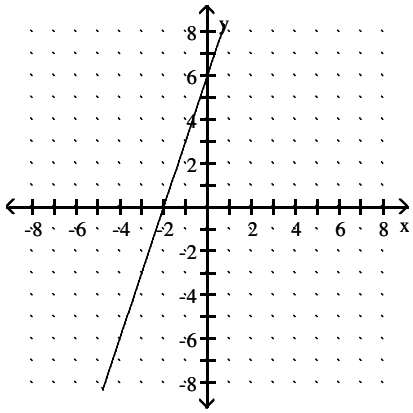

B)




C)




D)



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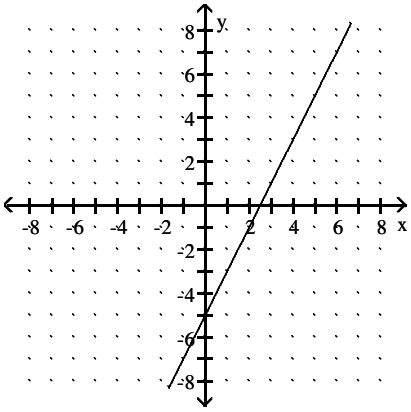
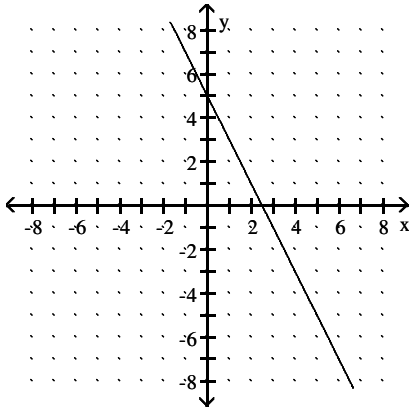
93) $y = -2x + 5$ 93) _____

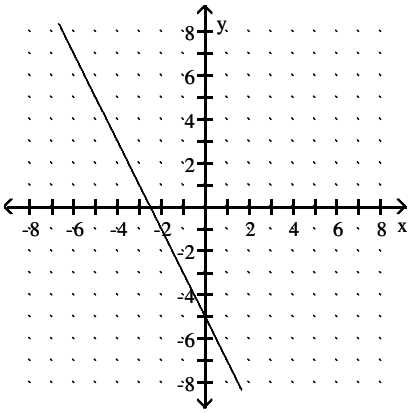
A)



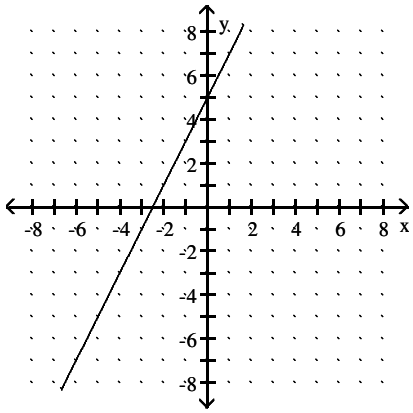

B)




C)




D)



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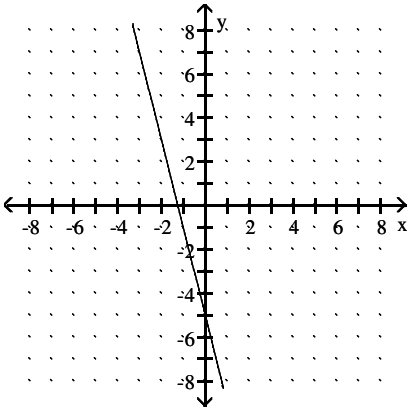
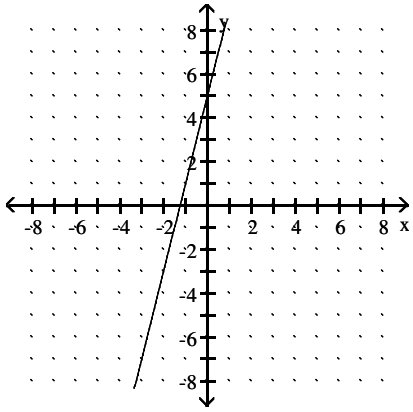
94) $y = -4x - 5$ 94) _____

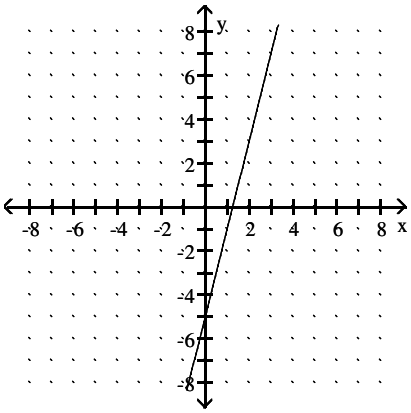
A)



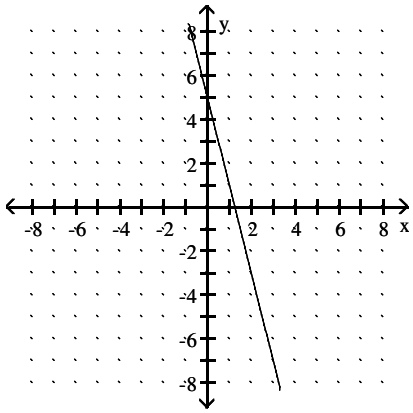

B)




C)




D)



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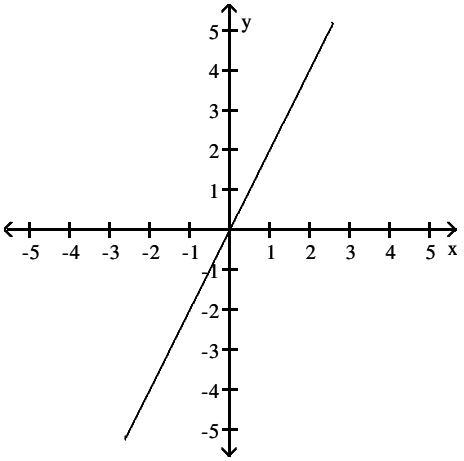
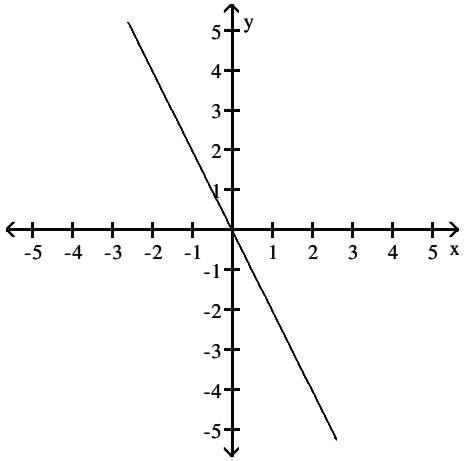
95) $y = -2x$ 95) _____

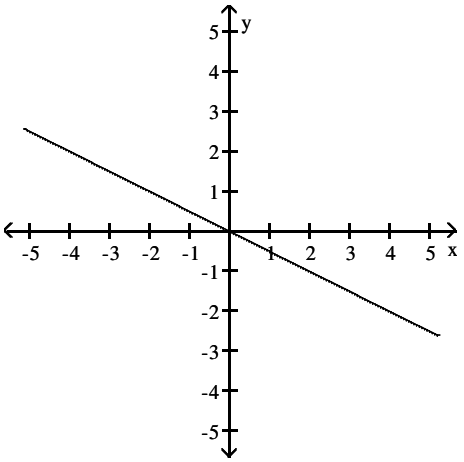
A)



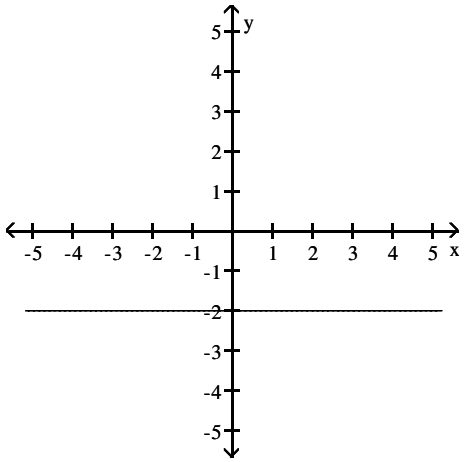

B)




C)




D)



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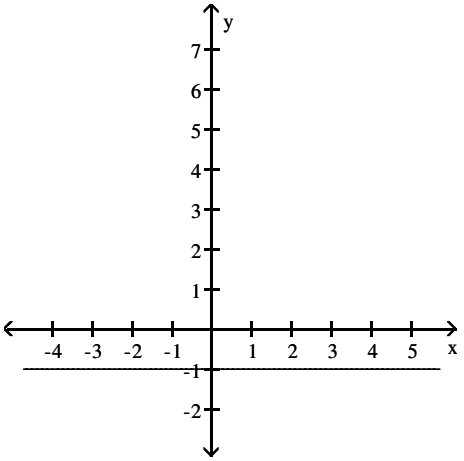
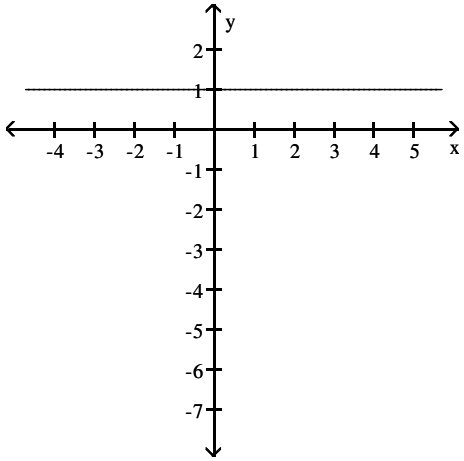
96) y = 1

96) _____

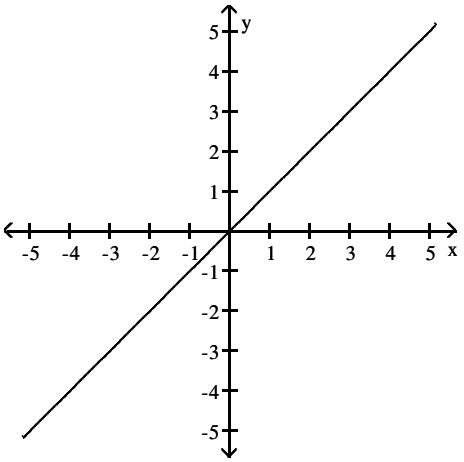
A)



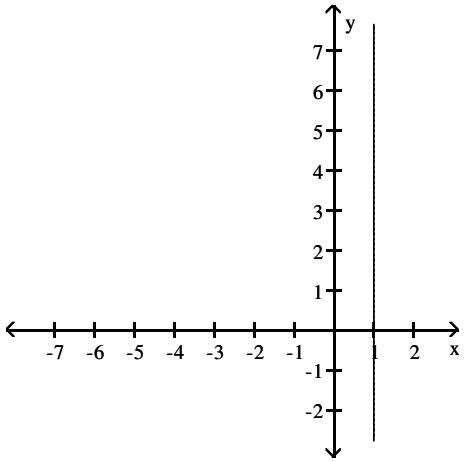

B)




C)




D)



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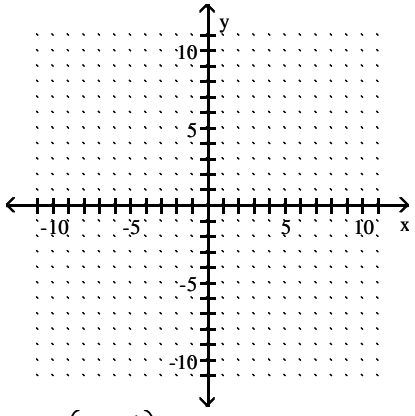
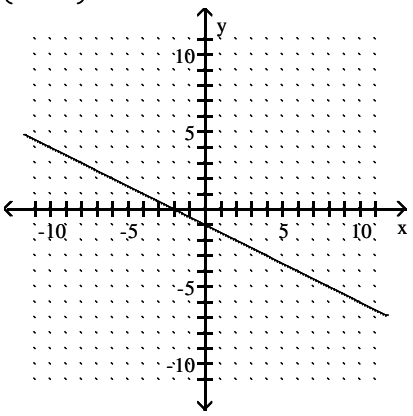
**Find the x– and y–intercepts for the equation. Then graph the equation.**

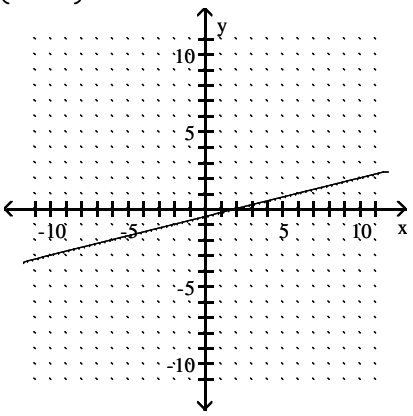
97) $16y - 4x = -8$ 97) _____




A) $\left(0, -\frac{1}{2}\right), (-2, 0)$




B) $\left(0, -\frac{1}{2}\right), (2, 0)$



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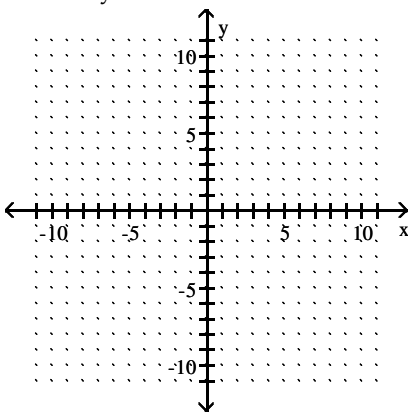
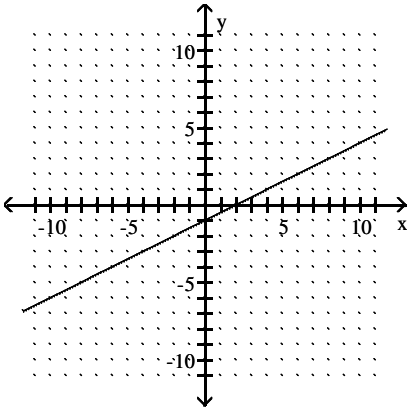
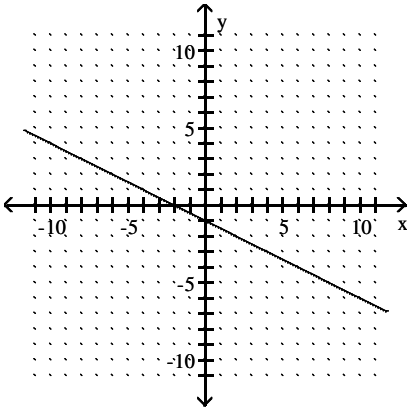
98) $-5x - 10y = 10$ 98) _____




A) (0, –1), (2, 0)




B) (0, –1), (–2, 0)



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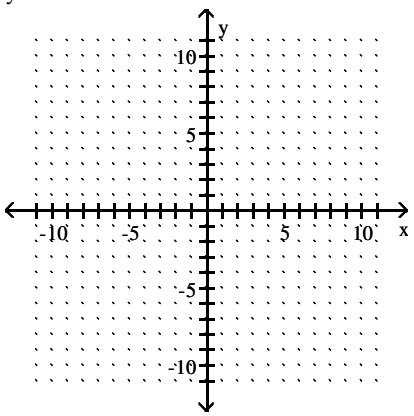
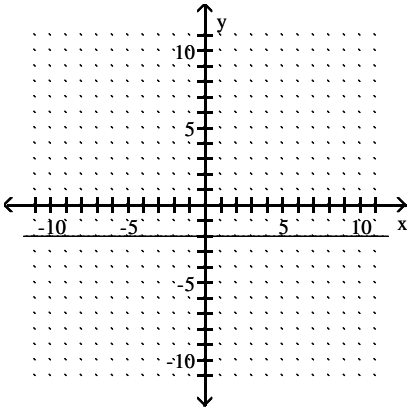
99) y = –2

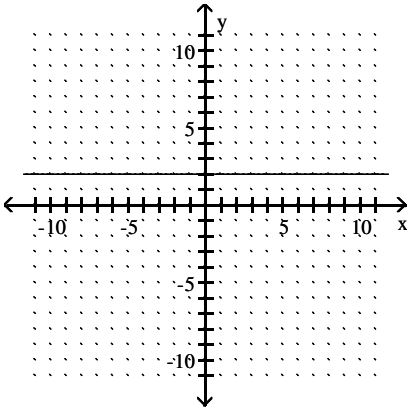
99) _____




A) (0, –2), (none)




B) (none), (–2, 0)



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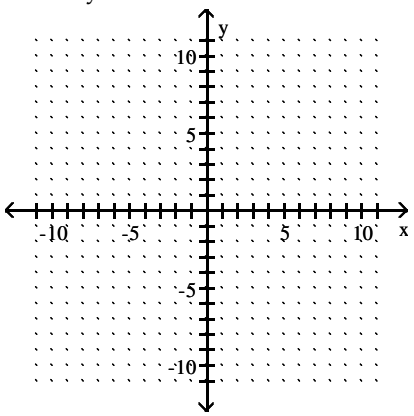
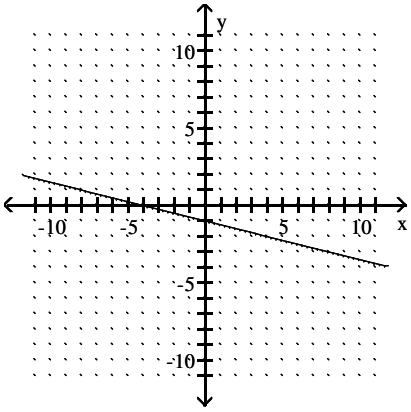
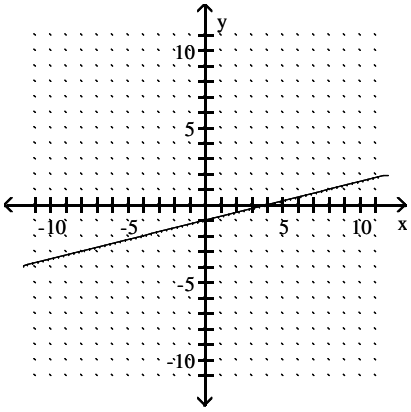
100) $5x - 20y = 20$ 100) _____




A) (0, –1), (–4, 0)




B) (0, –1), (4, 0)



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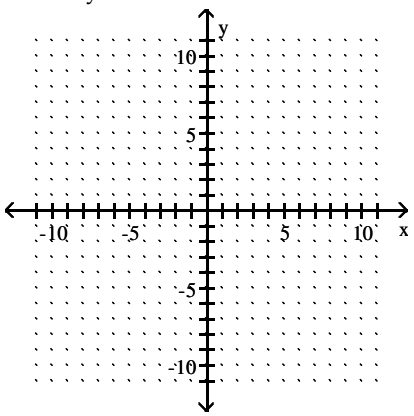
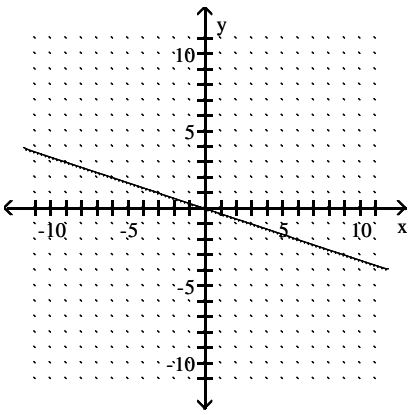
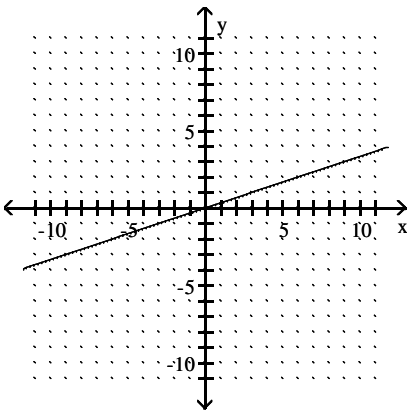
101) $6x - 18y = 0$ 101) _____




A) (0, 0), (0, 0)




B) (0, 0), (0, 0)




**Decide whether the pair of lines is parallel, perpendicular, or neither.**

102) $3x - 4y = 12$ 102) _____
$8x + 6y = 16$
A) Neither B) Parallel C) Perpendicular

103) $3x - 6y = -4$ 103) _____
$18x + 9y = -10$
A) Neither B) Perpendicular C) Parallel

104) $6x + 2y = 8$ 104) _____
$18x + 6y = 26$
A) Neither B) Perpendicular C) Parallel

105) The line through (3, –5) and (–1, 7) and the line through (6, –13) and (–2, 11) 105) _____
A) Perpendicular B) Neither C) Parallel

106) The line through (–20, 5) and (–4, 7) and the line through (–5, 5) and (7, 4) 106) _____
A) Neither B) Perpendicular C) Parallel



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**Find an equation of the line with slope m that passes through the given point. Put the answer in slope–intercept form.**

107) (4, 4), $m = -\frac{5}{9}$ 107) _____

A) $y = -\frac{5}{9}x - \frac{56}{9}$ B) $y = \frac{5}{9}x - \frac{56}{9}$ C) $y = -\frac{5}{9}x + \frac{56}{9}$ D) $y = \frac{5}{9}x + \frac{56}{9}$

108) (3, 4), $m = -\frac{5}{8}$ 108) _____

A) $y = -\frac{5}{8}x - \frac{47}{8}$ B) $y = \frac{5}{8}x + \frac{47}{8}$ C) $y = \frac{5}{8}x - \frac{47}{8}$ D) $y = -\frac{5}{8}x + \frac{47}{8}$

109) (0, 6), $m = \frac{6}{5}$ 109) _____

A) $y = -\frac{6}{5}x - 6$ B) $y = -\frac{6}{5}x + 6$ C) $y = \frac{6}{5}x + 6$ D) $y = \frac{6}{5}x - 6$

110) (0, 2), $m = -\frac{5}{6}$ 110) _____

A) $y = -\frac{5}{6}x + 2$ B) $y = \frac{5}{6}x - 2$ C) $y = \frac{5}{6}x + 2$ D) $y = -\frac{5}{6}x - 2$

111) (–3, –9), $m = 0$ 111) _____

A) $y = x - \frac{1}{3}$ B) $y = x + \frac{1}{3}$ C) $y = -9$ D) $x = -3$

112) (–9, 4), undefined slope 112) _____

A) $y = 4$ B) $y = x + \frac{9}{4}$ C) $x = -9$ D) $y = x - \frac{9}{4}$

**Write an equation in standard form for a line passing through the pair of points.**

113) (–7, –2) and (0, –5) 113) _____

A) $-3x - 7y = 35$ B) $3x - 7y = 35$ C) $-5x + 5y = -25$ D) $5x - 5y = -25$

114) (–3, 0) and (–7, 7) 114) _____

A) $-3x - 14y = -119$ B) $3x + 14y = -119$

C) $-7x + 4y = -21$ D) $7x + 4y = -21$

115) (4, –9) and (1, 7) 115) _____

A) $16x + 3y = 37$ B) $-13x + 6y = -55$ C) $13x - 6y = -55$ D) $-16x + 3y = 37$

116) (1, 4) and (–5, 9) 116) _____

A) $-5x + 6y = 29$ B) $3x + 14y = -141$

C) $5x + 6y = 29$ D) $-3x - 14y = -141$

117) (–4, 9) and (–4, –3) 117) _____

A) $9x - 3y = 0$ B) $-3x + 9y = 0$ C) $y = 9$ D) $x = -4$



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118) (–2, 1) and (6, 1) 118) _____

A) –2x + 6y = 0 B) 6x – 2y = 0 C) x = –2 D) y = 1

**Find an equation of the the line satisfying the given conditions.**

119) Through the origin with slope 9 119) _____

A) y = –9x B) y = 9x C) y = 9 D) x = 9

120) Through (–8, –4) and vertical 120) _____

A) y = 8 B) x = –8 C) x = 4 D) y = –8

121) Through (4, 3); perpendicular to 9x + 5y = 51 121) _____

A) 5x – 9y = 1 B) 5x – 9y = –7 C) 5x + 9y = –7 D) 9x – 5y = –7

122) Through (8, –2); parallel to –4x + 6y = –20 122) _____

A) 8x + 6y = –20 B) –4x + 6y = –44 C) 6x – 4y = –2 D) –4x – 6y = –44

123) Through (4, –2); parallel to 4.5x + 7.3y = 32.6 123) _____

A) 7.3x + 4.5y = –2 B) 4.5x + 7.3y = 3.4 C) 4.5x – 7.3y = 3.4 D) 4x + 7.3y = 32.6

124) Through (–6, 2); perpendicular to –2x – 5y = 22 124) _____

A) 5x – 2y = 24 B) –6x + 5y = 22 C) –2x – 5y = –34 D) 5x – 2y = –34

125) Through (–3, 10); perpendicular to –8x + 8y = 88 125) _____

A) –8x – 8y = 56 B) 8x – 8y = 56 C) 8x + 8y = 56 D) 8x – 8y = 88

**Solve the problem.**

126) Let C = 800 + 10x be the cost to manufacture x items. Find the average cost per item to produce 90 items. 126) _____

A) $90 B) $19 C) $8010 D) $7290

127) The rate of return of certain investments increases as the risk factor of the investment increases. An investment with a risk factor of 2 has a rate of return of 5.0%. An investment with a risk factor of 13 has a rate of return of 14.0%. What is the average rate of return per unit of risk? 127) _____

A) 0.67% per unit risk B) 0.82% per unit risk

C) 1.22% per unit risk D) 1.50% per unit risk

128) The cost of manufacturing a molded part is related to the quantity of part produced during a production run. When 100 parts are produced, the cost is $300. When 300 parts are produced, the cost is $1500. 128) _____

A) $6.00 per part B) $4.00 per part C) $7.00 per part D) $0.17 per part



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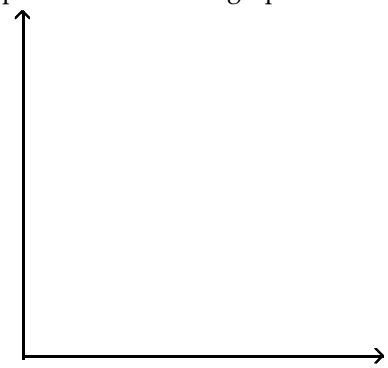
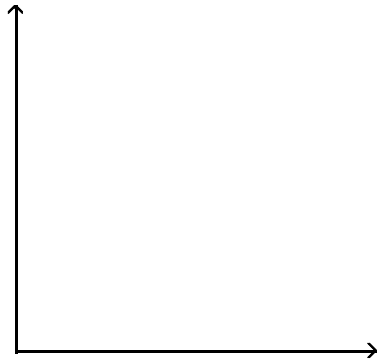
129) The cost, c, in dollars of car rental is $5 + \frac{1}{4}$m, where m is the number of miles driven. Graph the equation and use the graph to estimate the cost of car rental if the number of miles driven is 35. 129) _____



A) About 14 dollars
B) About 19 dollars
C) About 36.25 dollars
D) About 10 dollars

130) The population p, in thousands, of one town can be approximated by $p = 5 + \frac{3}{2}$d where d is the number of years since 1985. Graph the equation and use the graph to estimate the population of the town in the year 1991. 130) _____



A) About 22,000
B) About 14
C) About 14,000
D) About 18,000



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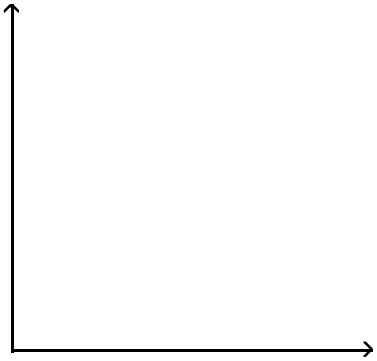
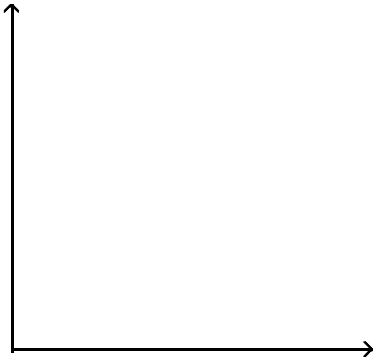
131) The value, v, in hundreds of dollars, of Juan's computer is approximated by $v = -\frac{1}{2}t + 8$, where t is the number of years since he first bought the computer. Graph the equation and use the graph to estimate the value of the computer 4 years after it was purchased. 131) _____



A) $400 B) $1000 C) $720 D) $600

132) During the month of January, the depth, d, of snow in inches at the base of one ski resort could be approximated by $d = -2t + 67$, where t is the number of days since December 31st. Graph the equation and use the graph to estimate the depth of snow on January 24th. 132) _____



A) 27 inches B) 24 inches C) 43 inches D) 19 inches



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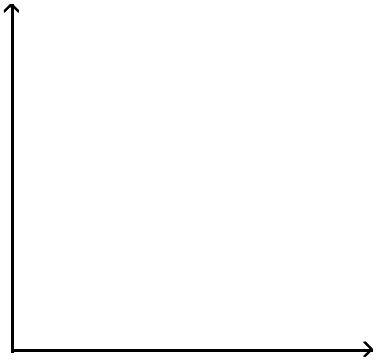
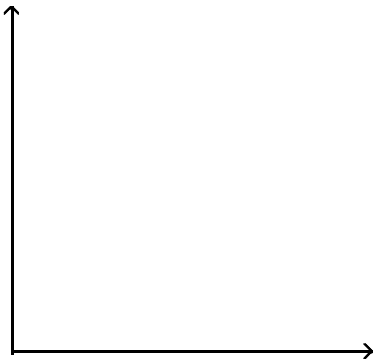
133) The cost, T, in hundreds of dollars, of tuition at one community college is given by $T = 2 + \frac{4}{5}c$, where c is the number of credits for which a student registers. Graph the equation and use the graph to estimate the cost of tuition if a student registers for 11 credits. 133) _____



A) About $800 B) About $1600 C) About $2000 D) About $1100

134) Alison sets aside $45 each month to spend on books and CDs. If she spends c dollars on CDs in a given month she may spend b dollars on books where $c + b = 45$. Graph the equation and use the graph to estimate the amount Alison may spend on books in March if she spends $32 on CDs. 134) _____



A) $24 B) $77 C) $13 D) $20



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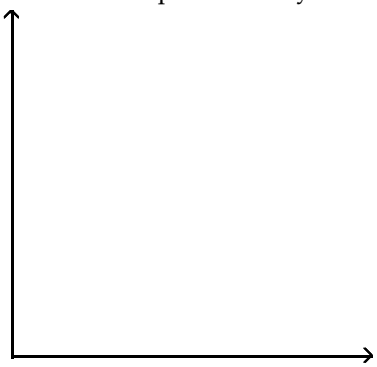
135) In one U.S. town the annual consumption, b, of beef (in kg per person) can be estimated by $b = -\frac{1}{3}t + 23$, where t is the number of years since 1975. Graph the equation and use the graph to estimate the beef consumption in the year 1986. 135) _____



A) About 19 kg per person
B) About 16 kg per person
C) About 27 kg per person
D) About 13 kg per person

**Use the given data points to construct a linear model, then use the model to find the appropriate Celsius or Fahrenheit temperature.**

136)

| | | | |
|---|---|---|---|
| Degrees Fahrenheit | 32 | 140 | 212 |
| Degrees Celsius | 0 | 60 | 100 |

136) _____

Choose any two data points and use them to construct a linear equation that models the data, with x Fahrenheit and y Celsius. Then use the equation to find the Celsius temperature corresponding to 17 Fahrenheit.

A) $y = \frac{5}{9}(x - 32)$; 80° Celsius
B) $y = \frac{9}{5}(x - 32)$; 259° Celsius
C) $y = \frac{5}{9}(x + 32)$; 116° Celsius
D) $y = \frac{9}{5}(x + 32)$; 374° Celsius

137)

| | | | |
|---|---|---|---|
| Degrees Fahrenheit | 32 | 149 | 185 |
| Degrees Celsius | 0 | 65 | 85 |

137) _____

Choose any two data points and use them to construct a linear equation that models the data, with x Celsius and y Fahrenheit. Then use the equation to find the Fahrenheit temperature corresponding t Celsius.

A) $y = \frac{5}{9}x + 32$; 40° Fahrenheit
B) $y = \frac{9}{5}x + 32$; 14° Fahrenheit
C) $y = \frac{9}{5}x + 32$; 104° Fahrenheit
D) $y = \frac{5}{9}x + 32$; 4° Fahrenheit

**Convert the temperature.**

138) 60°F = __ °C 138) _____

A) 76.0°C B) 1.3°C C) 15.6°C D) 140.0°C

139) 41°C = __ °F 139) _____

A) 131.4°F B) 54.8°F C) 11.3°F D) 105.8°F



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140) 8°F = __ °C 140) _____
A) 46.4°C B) 17.6°C C) –13.3°C D) 27.6°C

141) 176°C = __ °F 141) _____
A) 180.0°F B) 129.8°F C) 348.8°F D) 374.4°F

**Solve the problem.**

142) The bank's temperature display shows that it is 30° Celsius. What is the temperature in Fahrenheit? 142) _____
A) –1.1° B) 86.0° C) 34.4° D) 111.6°

143) On a summer day, the surface water of a lake is at a temperature of 28° Celsius. What is this temperature in Fahrenheit? 143) _____
A) 60° B) 28° C) 50.4° D) 82.4°

144) On a summer day, the bottom water of a lake is at a temperature of 10° Celsius. What is this temperature in Fahrenheit? 144) _____
A) 50° B) 42° C) 10° D) 18°

145) The outdoor temperature rises by 12° Fahrenheit. What is this temperature in Celsius? 145) _____
A) –11.1° B) –20° C) 12° D) 6.7°

146) A meteorologist in the Upper Peninsula of Michigan predicts an overnight low of –3° Fahrenheit. What would a Canadian meteorologist predict for the same location in Celsius? 146) _____
A) –3° B) –19.4° C) –1.7° D) –35°

147) Find the temperature at which the Celsius and Fahrenheit scales coincide. 147) _____
A) –23° B) 41° C) 0° D) –40°

148) Suppose the sales of a particular brand of appliance satisfy the relationship $S = 100x + 900$, where S represents the number of sales in year x, with $x = 0$ corresponding to 1982. Find the number of sales in 1993. 148) _____
A) 1900 B) 2000 C) 4000 D) 3900

149) Assume that the sales of a certain appliance dealer are approximated by a linear function. Suppose that sales were $10,500 in 1982 and $52,500 in 1987. Let $x = 0$ represent 1982. Find the equation giving yearly sales S. 149) _____
A) $S = 8400x + 10,500$ B) $S = 42,000x + 10,500$
C) $S = 8400x + 52,500$ D) $S = 42,000x + 52,500$

150) In a lab experiment 17 grams of acid were produced in 16 minutes and 19 grams in 39 minutes. Let y be the grams produced in x minutes. Write an equation for grams produced. 150) _____
A) $23y = 2x - 1$ B) $23y = 2x + 359$ C) $23y = 2x - 359$ D) $y = x - 1$

151) A biologist recorded 17 snakes on 17 acres in one area and 20 snakes on 43 acres in another area. Let y be the number of snakes in x acres. Write an equation for the number of snakes. 151) _____
A) $26y = 3x - 391$ B) $26y = 3x + 0$ C) $y = x + 0$ D) $26y = 3x + 391$



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**Use technology to compute r, the correlation coefficient.**

152) Consider the data points with the following coordinates: 152) _____

| x | 11.3 | 24.3 | 42.2 | 44.3 | 28.3 |
|---|---|---|---|---|---|
| y | 5 | 3 | 8 | 5 | 3 |

A) .4622 B) 0 C) .4114 D) –.4622

153) The test scores of 6 randomly picked students and the number of hours they prepared are as follows 153) _____

| Hours | 5 | 10 | 4 | 6 | 10 | 9 |
|---|---|---|---|---|---|---|
| Score | 64 | 86 | 69 | 86 | 59 | 87 |

A) –.2242 B) .2242 C) .6781 D) –.6781

154) The test scores of 6 randomly picked students and the number of hours they prepared are as follows 154) _____

| Hours | 4 | 10 | 5 | 5 | 3 | 3 |
|---|---|---|---|---|---|---|
| Score | 54 | 99 | 56 | 99 | 70 | 72 |

A) –.6781 B) –.2241 C) .6039 D) .2015

155) Consider the data points with the following coordinates: 155) _____

| x | 57 | 53 | 59 | 61 | 53 | 56 | 60 |
|---|---|---|---|---|---|---|---|
| y | 156 | 164 | 163 | 177 | 159 | 175 | 151 |

A) –.0537 B) .2145 C) –.0783 D) .1085

156) Consider the data points with the following coordinates: 156) _____

| x | 62 | 53 | 64 | 52 | 52 | 54 | 58 |
|---|---|---|---|---|---|---|---|
| y | 158 | 176 | 151 | 164 | 164 | 174 | 162 |

A) –.7749 B) .7537 C) 0 D) –.0810

157) Consider the data points with the following coordinates: 157) _____

| x | 121 | 101 | 128 | 160 | 154 | 126 | 134 |
|---|---|---|---|---|---|---|---|
| y | 171 | 152 | 168 | 157 | 164 | 169 | 160 |

A) .2245 B) –.0781 C) .5370 D) .0537

158) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 158) _____

| Cost | 9 | 2 | 3 | 4 | 2 | 5 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|
| Number | 85 | 52 | 55 | 68 | 67 | 86 | 83 | 73 |

A) .7077 B) .2353 C) .2456 D) –.0707

159) The following are costs of advertising (in thousands of dollars) and the number of products sold (in thousands): 159) _____

| Cost | 6 | 3 | 7 | 6 | 10 | 4 | 7 | 7 |
|---|---|---|---|---|---|---|---|---|
| Number | 54 | 75 | 91 | 57 | 96 | 52 | 92 | 100 |

A) .6112 B) .2635 C) .6756 D) –.3707

160) The following are the temperatures on randomly chosen days and the amount a certain kind of plan (in millimeters): 160) _____

| Temp | 62 | 76 | 50 | 51 | 71 | 46 | 51 | 44 | 79 |
|---|---|---|---|---|---|---|---|---|---|
| Growth | 36 | 39 | 50 | 13 | 33 | 33 | 17 | 6 | 16 |

A) .1955 B) –.2105 C) 0 D) .2563



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161) The following are the temperatures on randomly chosen days and the amount a certain kind of plan (in millimeters): 161) _____

| Temp | 77 | 88 | 85 | 61 | 64 | 72 | 73 | 63 | 74 |
|---|---|---|---|---|---|---|---|---|---|
| Growth | 39 | 17 | 12 | 22 | 15 | 29 | 14 | 25 | 43 |

A) .0396 B) –.0953 C) –.3105 D) 0

**Solve the problem using your calculator.**

162) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) wh they entered the program were between 3.5 and 4.0. The following data were obtained regarding the GPAs on entering the program versus their current GPAs. Use linear regression to find a linear func that predicts a student's current GPA as a function of his or her entering GPA. 162) _____

| Entering GPA | Current GPA |
|---|---|
| 3.5 | 3.6 |
| 3.8 | 3.7 |
| 3.6 | 3.9 |
| 3.6 | 3.6 |
| 3.5 | 3.9 |
| 3.9 | 3.8 |
| 4.0 | 3.7 |
| 3.9 | 3.9 |
| 3.5 | 3.8 |
| 3.7 | 4.0 |

A) y = 5.81 + 0.497x B) y = 2.51 + 0.329x
C) y = 4.91 + 0.0212x D) y = 3.67 + 0.0313x

163) The paired data below consist of the test scores of 6 randomly selected students and the number of h they studied for the test. Use linear regression to find a linear function that predicts a student's score function of the number of hours he or she studied. 163) _____

| Hours | 5 | 10 | 4 | 6 | 10 | 9 |
|---|---|---|---|---|---|---|
| Score | 64 | 86 | 69 | 86 | 59 | 87 |

A) y = 33.7 – 2.14x B) y = 67.3 + 1.07x
C) y = –67.3 + 1.07x D) y = 33.7 + 2.14x

164) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). Use linear regression to find a linear function that predicts the number products sold as a function of the cost of advertising. 164) _____

| Cost | 9 | 2 | 3 | 4 | 2 | 5 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|
| Number | 85 | 52 | 55 | 68 | 67 | 86 | 83 | 73 |

A) y = 55.8 + 2.79x B) y = 26.4 + 1.42x
C) y = –26.4 – 1.42x D) y = 55.8 – 2.79x



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165) The paired data below consist of the temperatures on randomly chosen days and the amount a certa of plant grew (in millimeters). Use linear regression to find a linear function that predicts a plant's g as a function of temperature. 165) _____

| Temp | 62 | 76 | 50 | 51 | 71 | 46 | 51 | 44 | 79 |
|---|---|---|---|---|---|---|---|---|---|
| Growth | 36 | 39 | 50 | 13 | 33 | 33 | 17 | 6 | 16 |

A) y = –14.6 – 0.211x
B) y = 7.30 + 0.122x
C) y = 14.6 + 0.211x
D) y = 7.30 – 0.112x

166) A study was conducted to compare the average time spent in the lab each week versus course grade computer students. The results are recorded in the table below. Use linear regression to find a linear function that predicts a student's course grade as a function of the number of hours spent in lab. 166) _____

| Number of hours spent in lab | Grade (percent) |
|---|---|
| 10 | 96 |
| 11 | 51 |
| 16 | 62 |
| 9 | 58 |
| 7 | 89 |
| 15 | 81 |
| 16 | 46 |
| 10 | 51 |

A) y = 0.930 + 44.3x
B) y = 1.86 + 88.6x
C) y = 44.3 + 0.930x
D) y = 88.6 – 1.86x

167) Two separate tests are designed to measure a student's ability to solve problems. Several students ar randomly selected to take both tests and the results are shown below. Use linear regression to find a function that predicts a student's score on Test B as a function of his or her score on Test A. 167) _____

| Test A | 48 | 52 | 58 | 44 | 43 | 43 | 40 | 51 | 59 |
|---|---|---|---|---|---|---|---|---|---|
| Test B | 73 | 67 | 73 | 59 | 58 | 56 | 58 | 64 | 74 |

A) y = –19.4 – 0.930x
B) y = 19.4 + 0.930x
C) y = 0.930 – 19.4x
D) y = –0.930 + 19.4x



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**Solve the problem.**

168) Ten students in a graduate program were randomly selected. Their grade point averages (GPAs) when they entered the program were between 3.5 and 4.0. The following data were obtained regarding their GPAs on entering the program versus their current GPAs. By using linear regression, the following equation is obtained: $y = 3.67 + 0.0313x$ where x is entering GPA and y is current GPA. Use this equation to predict current GPA of a student whose entering GPA is 3.6. 168) _____

| Entering GPA | Current GPA |
|---|---|
| 3.5 | 3.6 |
| 3.8 | 3.7 |
| 3.6 | 3.9 |
| 3.6 | 3.6 |
| 3.5 | 3.9 |
| 3.9 | 3.8 |
| 4.0 | 3.7 |
| 3.9 | 3.9 |
| 3.5 | 3.8 |
| 3.7 | 4.0 |

A) 3.29 B) 3.40 C) 3.58 D) 3.78

169) The paired data below consist of the test scores of 6 randomly selected students and the number of hours they studied for the test. By using linear regression, the following equation is obtained: $y = 67.3 + 1.07x$ where x is number of hours studied and y is score on the test. Use this equation to predict the score on the test of a student who studies 14 hours. 169) _____

| Hours | 5 | 10 | 4 | 6 | 10 | 9 |
|---|---|---|---|---|---|---|
| Score | 64 | 86 | 69 | 86 | 59 | 87 |

A) 82.3 B) 77.3 C) 88.3 D) 87.3

170) The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). By using linear regression, the following equation is obtained: $y = 55.8 + 2.79x$ where x is the cost of advertising (in thousands of dollars) and y is number of products sold (in thousands). Use this equation to predict the number of products sold if the cost of advertising is $12,000. 170) _____

| Cost | 9 | 2 | 3 | 4 | 2 | 5 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|
| Number | 85 | 52 | 55 | 68 | 67 | 86 | 83 | 73 |

A) 33,535.8 B) 95.98 C) 86.28 D) 89.28

171) The paired data below consist of the temperatures on randomly chosen days and the amount a certain kind of plant grew (in millimeters). By using linear regression, the following equation is obtained: $y = 14.6 + 0.211x$ where x is temperature and y is growth in millimeters. Use this equation to predict the growth of a plant if the temperature is 79. 171) _____

| Temp | 62 | 76 | 50 | 51 | 71 | 46 | 51 | 44 | 79 |
|---|---|---|---|---|---|---|---|---|---|
| Growth | 36 | 39 | 50 | 13 | 33 | 33 | 17 | 6 | 16 |

A) 29.61 B) 31.27 C) 31.90 D) 32.53



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172) A study was conducted to compare the average time spent in the lab each week versus course grade for computer students. The results are recorded in the table below. By using linear regression, the following equation is obtained: $y = 88.6 - 1.86x$ where x is the number of hours spent in the lab and y is grade on the test. Use this equation to predict the grade of a student who spends 13 hours in the lab. 172) _____

| Number of hours spent in lab | Grade (percent) |
|---|---|
| 10 | 96 |
| 11 | 51 |
| 16 | 62 |
| 9 | 58 |
| 7 | 89 |
| 15 | 81 |
| 16 | 46 |
| 10 | 51 |

A) 75.6 B) 60.4 C) 67.0 D) 64.4

173) The information in the chart gives the salary of a person for the stated years. Model the data with a linear equation using the points (1, 24,300) and (3, 26,600). 173) _____

| Year, x | Salary, y |
|---|---|
| 1990, 0 | $23,500 |
| 1991, 1 | $24,300 |
| 1992, 2 | $25,200 |
| 1993, 3 | $26,600 |
| 1994, 4 | $27,200 |

A) $y = 1150x + 23,500$ B) $y = 28.9x + 23,500$
C) $y = 1150x$ D) $y = -1393x + 23,500$

174) The information in the chart below gives the salary of a person for the stated years. Model the data with a linear equation using the points (1, 24,700) and (3, 26,300). Then use this equation to predict the salary for the year 2002. 174) _____

| Year, x | Salary, y |
|---|---|
| 1990, 0 | $23,500 |
| 1991, 1 | $24,700 |
| 1992, 2 | $25,200 |
| 1993, 3 | $26,300 |
| 1994, 4 | $27,200 |

A) $33,140 B) $33,080 C) $33,100 D) $33,120



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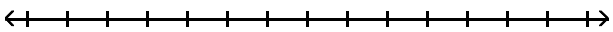
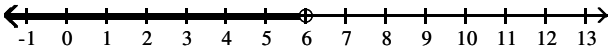
**Solve and graph the inequality and graph the solution.**

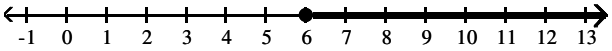
175) $x - 5 < 1$ 175) _____



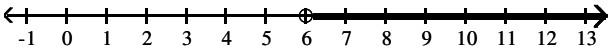
A) $(-\infty, 6)$



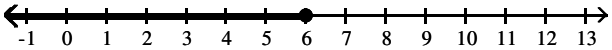

B) $[6, \infty)$



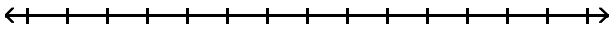

C) $(6, \infty)$



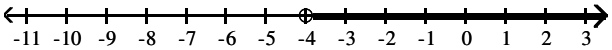

D) $(-\infty, 6]$



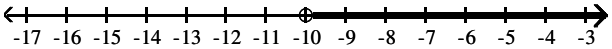

176) $4z - 3 > 3z - 7$ 176) _____



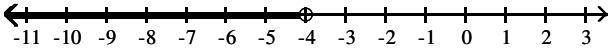
A) $(-4, \infty)$



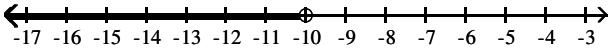

B) $(-10, \infty)$




C) $(-\infty, -4)$




D) $(-\infty, -10)$



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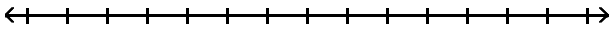
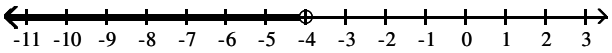
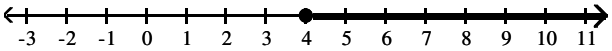
177) $-4x - 8 \leq -5x - 4$ 177) _____



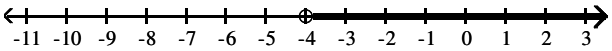
A) $(-\infty, -4)$



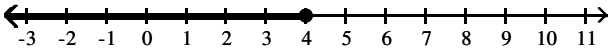

B) $[4, \infty)$



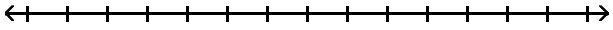

C) $(-4, \infty)$



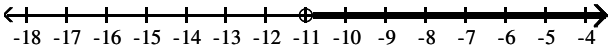

D) $(-\infty, 4]$



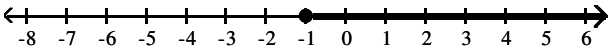

178) $-11a + 2 \geq -12a + 1$ 178) _____



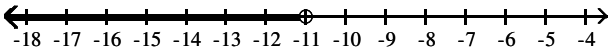
A) $(-11, \infty)$



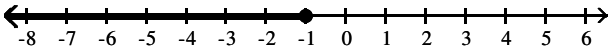

B) $[-1, \infty)$




C) $(-\infty, -11)$




D) $(-\infty, -1]$



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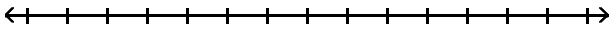
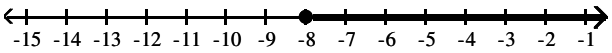
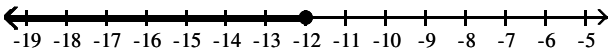
179) $-12x + 10 \geq -11x + 2$ 179) _____



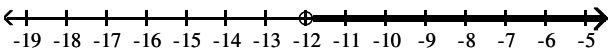
A) $[-8, \infty)$



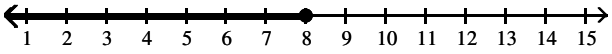

B) $(-\infty, -12]$



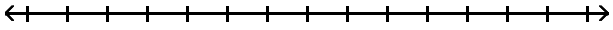

C) $(-12, \infty)$



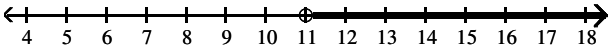

D) $(-\infty, 8]$



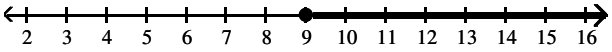

180) $3 + 11y + 1 \geq 10y + 13$ 180) _____



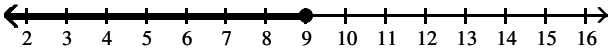
A) $(11, \infty)$



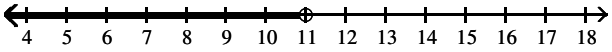

B) $[9, \infty)$




C) $(-\infty, 9]$




D) $(-\infty, 11)$



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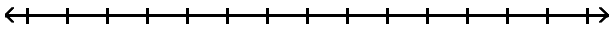
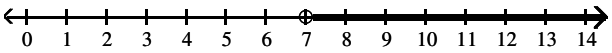
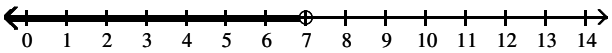
181) $30x + 18 > 6(4x + 10)$ 181) _____



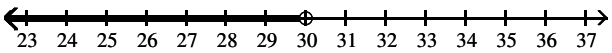
A) $(7, \infty)$



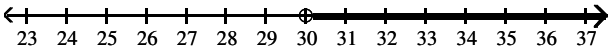

B) $(-\infty, 7)$



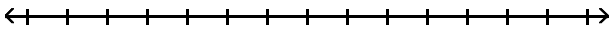

C) $(-\infty, 30)$



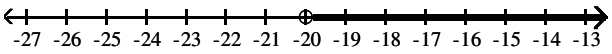

D) $(30, \infty)$



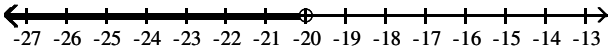

182) $-4(4x - 6) < -20x + 32$ 182) _____



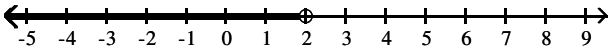
A) $(-20, \infty)$



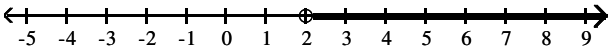

B) $(-\infty, -20)$




C) $(-\infty, 2)$




D) $(2, \infty)$



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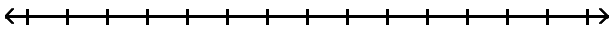
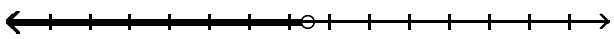
183) $\frac{8x+4}{3} < \frac{5}{2}$ 183) _____

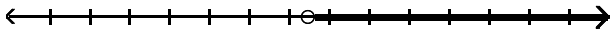


A) $\left(-\infty, \frac{7}{16}\right)$



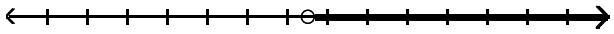
$\frac{7}{16}$

B) $\left(\frac{7}{16}, \infty\right)$



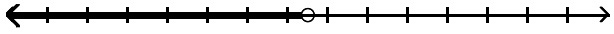
$\frac{7}{16}$

C) $\left(\frac{5}{2}, \infty\right)$



$\frac{5}{2}$

D) $\left(-\infty, \frac{5}{2}\right)$



$\frac{5}{2}$



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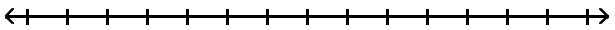
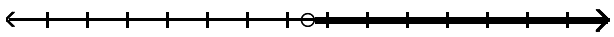
184) $\frac{4x-3}{-2} < -\frac{5}{4}$ 184) _____

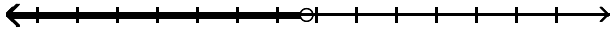


A) $\left(\frac{11}{2}, \infty\right)$



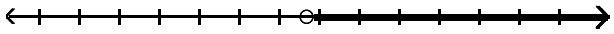
$\frac{11}{2}$

B) $\left(-\infty, -\frac{5}{4}\right)$



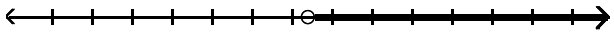
$-\frac{5}{4}$

C) $\left(-\frac{5}{16}, \infty\right)$



$-\frac{5}{16}$

D) $\left(\frac{11}{8}, \infty\right)$



$\frac{11}{8}$

**Solve the problem.**

185) In order for a chemical reaction to take place, the Fahrenheit temperature of the reagents must be at least 131.16°F. Find the Celsius temperatures at which the reaction may occur. ($F = \frac{9}{5}C + 32$) 185) _____

A) $C \leq 55.09°$ B) $C \geq 268.09°$ C) $C \geq 55.09°$ D) $C < 268.09°$

186) In order for a chemical reaction to remain stable, its Celsius temperature must be no more than 146.18°C. Find the Fahrenheit temperatures at which the reaction will remain stable. ($F = \frac{9}{5}C + 32$) 186) _____

A) $F \geq 295.12°$ B) $F \leq 63.43°$ C) $F \geq 63.43°$ D) $F \leq 295.12°$

187) The equation $y = 0.002x - 0.30$ can be used to determine the approximate profit, y in dollars, of producing x items. How many items must be produced so the profit will be at least $3635? 187) _____

A) $x \geq 1{,}817{,}350$ B) $0 < x \leq 1{,}817{,}649$

C) $x \geq 1{,}908{,}532.50$ D) $x \geq 1{,}817{,}650$



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188) The equation $y = 0.002x + 0.20$ can be used to determine the approximate cost, y in dollars, of producing x items. How many items must be produced so the cost will be no more than $105? 188) _____

A) $0 < x \leq 52{,}401$ B) $0 < x \leq 52{,}400$
C) $0 < x \leq 52{,}600$ D) $0 < x \leq 55{,}020.00$

189) A rectangular enclosure must have an area of at least 4200 $yd^2$. If 260 yd of fencing is to be used, and the width cannot exceed the length, within what limits must the width of the enclosure lie? 189) _____

A) $60 \leq w \leq 65$ B) $60 \leq w \leq 70$ C) $0 \leq w \leq 60$ D) $65 \leq w \leq 70$

190) A retailer knows that n games can be sold in a month if the price is $30 - 0.2n$ dollars per game. If he buys each game for $18, and if he wishes to make a profit of at least $160 per month on sales of this game, how many games must he sell each month? 190) _____

A) $20 \leq n \leq 30$ B) $20 \leq n \leq 40$ C) $20 \leq n \leq 60$ D) $20 \leq n \leq 20$

191) Paul has grades of 97 and 65 on his first two tests. What must he score on his third test in order to have an average of at least 70? 191) _____

A) at least 48 B) at most 70 C) at least 81 D) at most 77

192) Sue drove her car 458 miles in January, 324 miles in February, and 410 miles in March. If her average mileage for the four months from January to April is to be at least 383 miles, how many miles must she drive in April? 192) _____

A) at most 340 miles B) at least 394 miles
C) at least 340 miles D) at most 383 miles

193) During the first four months of the year, Jack earned $980, $950, $1200 and $520. If Jack must have an average salary of at least $850 in order to earn retirement benefits, what must Jack earn in the fifth month in order to qualify for benefits? 193) _____

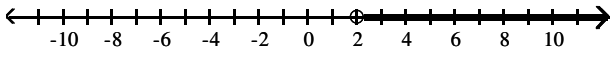
A) at most $913 B) at most $850 C) at least $900 D) at least $600

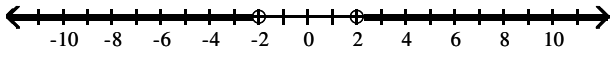
194) Jon has 1043 points in his math class. He must have 87% of the 1400 points possible by the end of the term to receive credit for the class. What is the minimum number of additional points he must earn by the end of the term to receive credit for the class? 194) _____

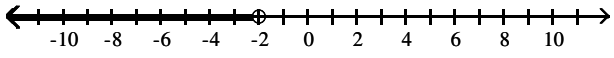
A) 907 points B) 175 points C) 357 points D) 1218 points

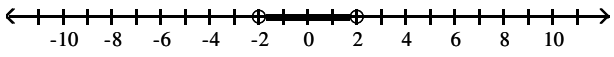
**Solve the inequality and graph the solution.**

195) $|x| > 2$ 195) _____

A)



B)



C)



D)


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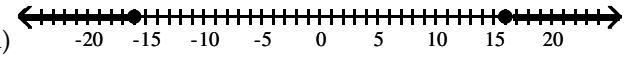
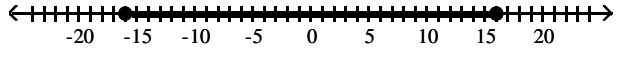
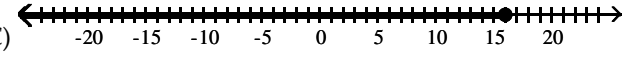
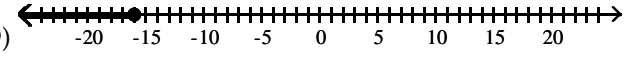
196) $|x| \leq 16$ 196) _____

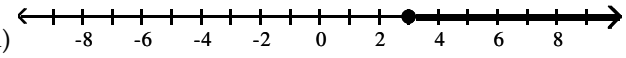
A) 

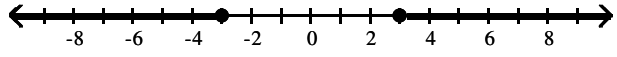

B) 

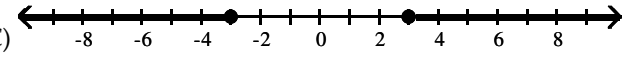

C) 

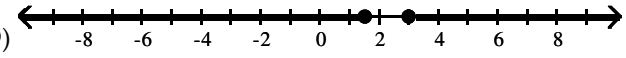

D) 


197) $|4x - 9| \geq 3$ 197) _____

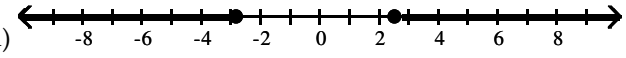
A) 

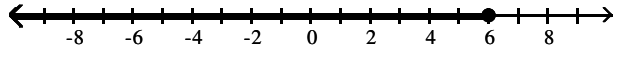

B) 

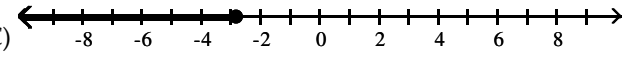

C) 

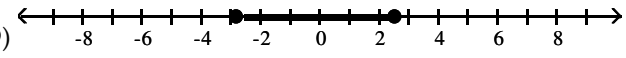

D) 


198) $|6x + 1| < 16$ 198) _____

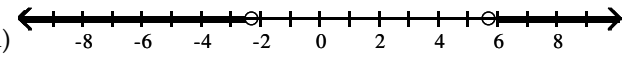
A) 

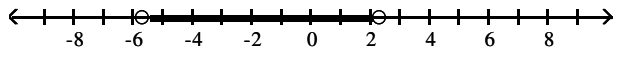

B) 

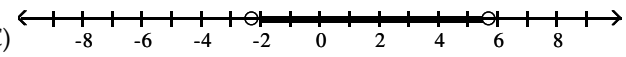

C) 

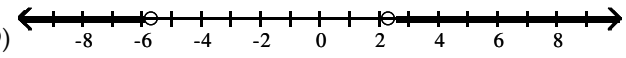

D) 


199) $|r - 1.7| < 4$ 199) _____

A) 


B) 


C) 


D) 

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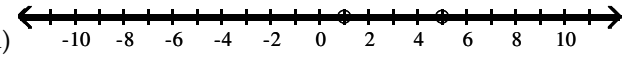
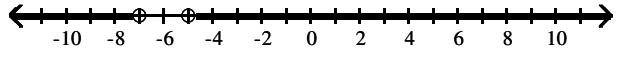
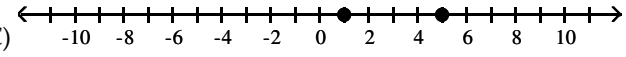
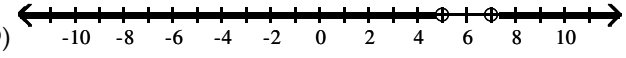
200) $|b - 3| + 3 > 1$ 200) _____

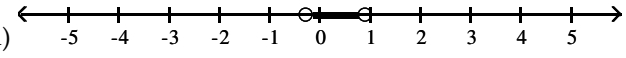
A) 


B) 

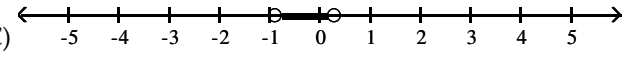

C) 

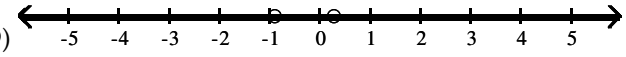

D) 


201) $|8s + 3| < |s + 5|$ 201) _____

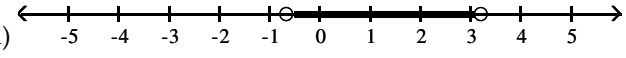
A) 

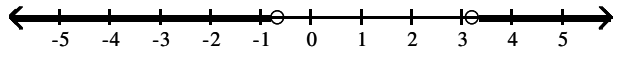

B) ∅

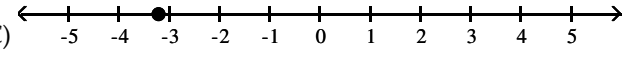
C) 


D) 


202) $|4s - 7| > |s - 9|$ 202) _____

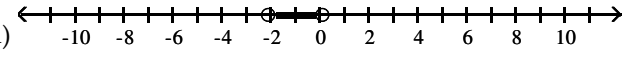
A) 

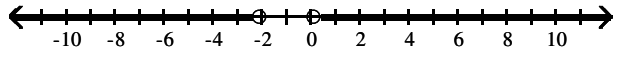

B) 

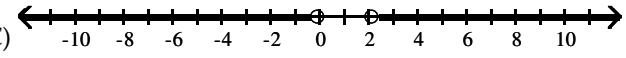

C) 

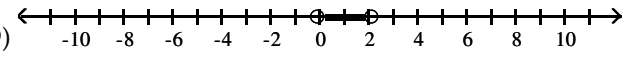

D) ∅

203) $8|x - 1| < 9$ 203) _____

A) 


B) 


C) 


D) 

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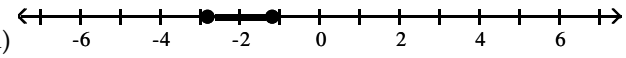
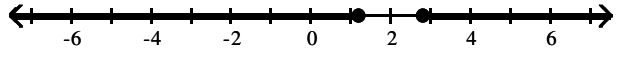
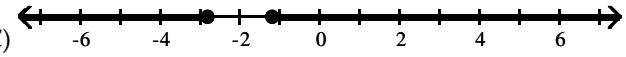
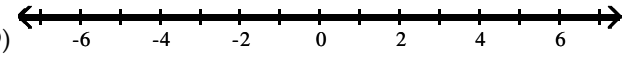
204) $5|x + 2| \geq 4$ 204) _____

A) 


B) 


C) 


D) 


**Solve the inequality.**

205) A salesperson has two job offers. Company A offers a weekly salary of $300 plus commission of 10% of sales. Company B offers a weekly salary of $600 plus commission of 5% of sales. What is the amount of sales above which Company A's offer is the better of the two? 205) _____

A) $3000 B) $6000 C) $6100 D) $12,000

206) Company A rents copiers for a monthly charge of $150 plus 10 cents per copy. Company B rents copiers for a monthly charge of $300 plus 5 cents per copy. What is the number of copies above which Company A's charges are the higher of the two? 206) _____

A) 3100 copies B) 6000 copies C) 3000 copies D) 1500 copies

207) A car rental company has two rental rates. Rate 1 is $63 per day plus $0.18 per mile. Rate 2 is $126 per day plus $0.09 per mile. If you plan to rent for one week, how many miles would you need to drive to pay less by taking Rate 2? 207) _____

A) more than 4900 miles B) more than 17,150 miles
C) more than 5000 miles D) more than 9800 miles

208) In order for a chemical reaction to take place, the Fahrenheit temperature of the reagents must be at least 194.25°F. Find the Celsius temperatures at which the reaction may occur. ($F = \frac{9}{5}C + 32$) 208) _____

A) $C \geq 90.14°$ B) $C \leq 90.14°$ C) $C \geq 381.65°$ D) $C < 381.65°$

209) In order for a chemical reaction to remain stable, its Celsius temperature must be no more than 131.77°C. Find the Farenheit temperatures at which the reaction will remain stable. ($F = \frac{9}{5}C + 32$) 209) _____

A) $F \geq 269.19°$ B) $F \leq 55.43°$ C) $F \geq 55.43°$ D) $F \leq 269.19°$

210) The equation $y = 0.002x + 0.30$ can be used to determine the approximate profit, y in dollars, of producing x items. How many items must be produced so the profit will be at least $4645? 210) _____

A) $0 < x \leq 2{,}322{,}349$ B) $x \geq 2{,}322{,}650$
C) $x \geq 2{,}322{,}350$ D) $x < 2{,}322{,}350$

211) Correct Computers, Inc., finds that the cost to make x laptop computers is $C = 3316x + 147{,}692$, while the revenue produced from them is $R = 3537x$ (C and R are in dollars). What is the smallest whole number of computers, x, that must be sold for the company to show a profit? 211) _____

A) 1,012,133,276 B) 22 C) 669 D) 32,639,932



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212) Fantastic Flags, Inc., finds that the cost to make x flags is C = 39x + 14,869, while the revenue produced from them is R = 44x (C and R are in dollars). What is the smallest whole number of flags, x, that must be sold for the company to show a profit? 212) _____

A) 74,345 B) 180 C) 1,234,127 D) 2974

213) Behemoth Back Packs, Inc., finds that the cost to make x back packs is C = 75x + 7059, while the revenue produced from them is R = 108x (C and R are in dollars). What is the smallest whole number of back packs, x, that must be sold for the company to show a profit? 213) _____

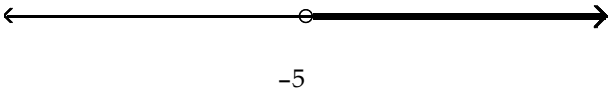
A) 39 B) 232,947 C) 214 D) 1,291,797

**Solve the inequality and graph the solution.**

214) $(x - 8)(x + 5) > 0$ 214) _____



A) (–5, ∞)




B) (–∞, –5) or (8, ∞)




C) (–∞, –8) or (5, ∞)




D) (–5, 8)



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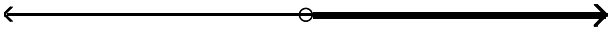
215) $p^2 - 10p + 24 > 0$ 215) _____



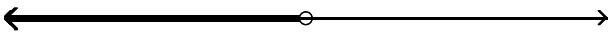
A) (4, 6)



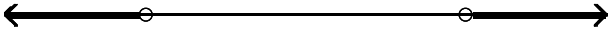

B) (6, ∞)




C) (−∞, 4)




D) (−∞, 4) or (6, ∞)



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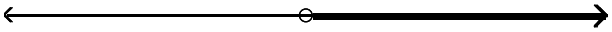
216) $s^2 - 3s - 10 < 0$ 216) _____

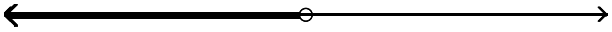


A) (5, ∞)



5

B) (−∞, −2)



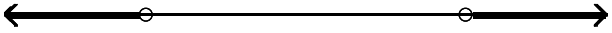
−2

C) (−2, 5)



−2 5

D) (−∞, −2) or (5, ∞)



−2 5



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217) $t^2 - 6t - 7 \leq 0$ 217) _____



A) $(-\infty, -1]$



$-1$

B) $[7, \infty)$



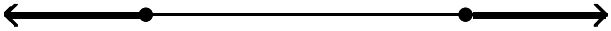
$7$

C) $[-1, 7]$



$-1$ $7$

D) $(-\infty, -1]$ or $[7, \infty)$



$-1$ $7$



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218) $v^2 + 6v + 5 \geq 0$ 218) _____



A) [–5, –1]



–5 –1

B) [–1, ∞)



–1

C) (–∞, –5] or [–1, ∞)



–5 –1

D) (–∞, –5]



–5



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219) $x^2 - 4x \leq -3$ 219) _____



A) (–3, –1)



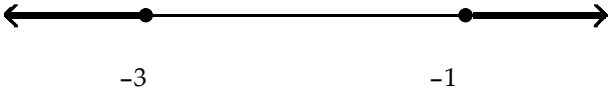

B) [–3, –1]




C) [1, 3]




D) (–∞, –3] or [–1, ∞)



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220) $x^2 - 3x \geq -2$ 220) _____



A) $(-\infty, 1]$




B) $[2, \infty)$




C) $(-\infty, 1]$ or $[2, \infty)$




D) $[1, 2]$






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221) $v^2 + 7v + 10 \geq 0$ 221) _____

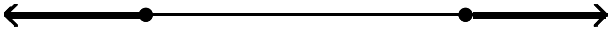


A) $(-\infty, -5]$



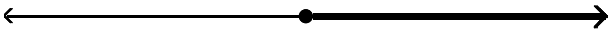


B) $(-\infty, -5]$ or $[-2, \infty)$





C) $[-2, \infty)$





D) $[-5, -2]$







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222) $x^2 + 4x \leq -3$ 222) _____



A) [–3, –1]




B) (1, 3)




C) (–∞, 1] or [3, ∞)




D) [1, 3]






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223) $x^2 + 7x \geq -12$ 223) _____

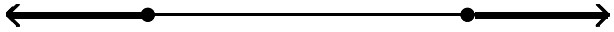


A) [–4, –3]



–4 –3

B) (–∞, –4] or [–3, ∞)



–4 –3

C) [–3, ∞)



–3

D) (–∞, –4]



–4

**Solve the inequality.**

224) $(a + 1)(a - 3)(a - 4) > 0$ 224) _____

A) (–∞, 3) B) (–∞, –1) or (3, 4) C) (4, ∞) D) (–1, 3) or (4, ∞)

225) $(b + 4)(b - 5)(b - 6) < 0$ 225) _____

A) (–4, 5) or (6, ∞) B) (6, ∞) C) (–∞, 5) D) (–∞, –4) or (5, 6)

226) $(c + 5)(c - 4)(c - 5) > 0$ 226) _____

A) (5, ∞) B) (–5, 4) or (5, ∞) C) (–∞, 4) D) (–∞, –5) or (4, 5)

227) $(a + 7)(a^2 + 6a + 5) > 0$ 227) _____

A) (–7, –5) or (–1, ∞) B) (–∞, –5)

C) (–∞, –7) or (–5, –1) D) (–1, ∞)

228) $m^3 - 16m \geq 0$ 228) _____

A) (–4, 0] or [4, ∞) B) (–4, 0) or (4, ∞) C) [–4, 0] or [4, ∞) D) [–4, 0) or (4, ∞)

229) $p^3 - 9p \leq 0$ 229) _____

A) (–∞, –3) or (0, 3) B) (–∞, –3) or [0, 3] C) (–∞, –3] or [0, 3] D) (–∞, –3] or (0, 3)



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230) $12k^3 - 16k^2 \le 3k$ 230) _____

A) $\left(-\infty, -\frac{1}{6}\right)$ or $\left[0, \frac{3}{2}\right]$

B) $\left(-\infty, -\frac{1}{6}\right]$ or $\left(0, \frac{3}{2}\right)$

C) $\left(-\infty, -\frac{1}{6}\right)$ or $\left(0, \frac{3}{2}\right)$

D) $\left(-\infty, -\frac{1}{6}\right]$ or $\left[0, \frac{3}{2}\right]$

231) $\frac{-2x + 7}{6} > 0$ 231) _____

A) $(-\infty, 0)$ B) $\left(-\infty, -\frac{7}{2}\right)$ C) $\left(-\frac{7}{2}, \infty\right)$ D) $\left(-\infty, \frac{7}{2}\right)$

232) $\frac{-2}{-2x - 2} > 0$ 232) _____

A) $(-\infty, -1)$ B) $(-1, \infty)$ C) $(-\infty, 1)$ D) $(0, \infty)$

233) $\frac{-4x + 6}{5x^2 + 7} > 0$ 233) _____

A) $\left(-\infty, -\frac{2}{3}\right)$ B) $\left(-\infty, \frac{3}{2}\right)$ C) $(-\infty, 0)$ D) $\left(-\frac{3}{2}, \infty\right)$

234) $\frac{6x + 7}{6x^2 + 6} > 0$ 234) _____

A) $\left(-\frac{7}{6}, \infty\right)$ B) $(0, \infty)$ C) $\left(-\infty, -\frac{7}{6}\right)$ D) $\left(-\infty, -\frac{6}{7}\right)$

235) $\frac{3x}{7 - x} < x$ 235) _____

A) (0, 4) or (7, ∞) B) (7, ∞) C) (4, 7) D) (−∞, 4) or (7, ∞)

236) $\frac{2x}{6 - x} > x$ 236) _____

A) (6, ∞) B) (0, 4) or (6, ∞) C) (−∞, 0) or (4, 6) D) (−∞, 4) or (6, ∞)

237) $\frac{2x}{6 - x} \le 2x$ 237) _____

A) (−∞, 5] or [6, ∞) B) [6, ∞) C) [0, 5] or (6, ∞) D) [5, 6]

238) $\frac{5x}{5 - x} \ge 5x$ 238) _____

A) [0, 4] or [5, ∞) B) [5, ∞) C) (−∞, 0] or [4, 5) D) (−∞, 4] or [5, ∞)

239) $\frac{x^2 - 12x + 27}{x - 5} > 0$ 239) _____

A) (−∞, 5) or (−9, ∞)

B) (−∞, −9) or (−3, 5)

C) (3, 5) or (9, ∞)

D) (−9, 5)



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240) $\frac{x^2 + 4x - 5}{x^2 - 2x - 48} < 0$ 240) _____

A) $(-\infty, -5)$ or $(-6, 8)$
B) $(-6, -5)$ or $(1, 8)$
C) $(-6, -5)$ or $(1, \infty)$
D) $(-5, 1)$ or $(8, \infty)$

241) $p^2 + 5p + 4 > 0$ 241) _____

A) $(-1, \infty)$
B) $(-\infty, -4)$
C) $(-4, -1)$
D) $(-\infty, -4)$ or $(-1, \infty)$

242) $s^2 - 4s - 21 < 0$ 242) _____

A) $(-\infty, -3)$
B) $(-3, 7)$
C) $(-\infty, -3)$ or $(7, \infty)$
D) $(7, \infty)$

243) $t^2 - 2t - 3 \le 0$ 243) _____

A) $[3, \infty)$
B) $(-\infty, -1]$
C) $(-\infty, -1]$ or $[3, \infty)$
D) $[-1, 3]$

244) $v^2 + 5v + 4 \ge 0$ 244) _____

A) $[-4, -1]$
B) $(-\infty, -4]$ or $[-1, \infty)$
C) $(-\infty, -4]$
D) $[-1, \infty)$

245) $x^2 + 7x \le -12$ 245) _____

A) $(-\infty, 3]$ or $[4, \infty)$
B) $(3, 4)$
C) $[3, 4]$
D) $[-4, -3]$

246) $x^2 + 5x \ge -4$ 246) _____

A) $[-1, \infty)$
B) $(-\infty, -4]$ or $[-1, \infty)$
C) $(-\infty, -4]$
D) $[-4, -1]$

247) $x^2 - 2.17x - 3.51 < 0$ 247) _____

(Give approximations rounded to the nearest hundredth.)

A) $(-3.25, 1.08)$
B) $(-\infty, -3.25) \cup (1.08, \infty)$
C) $(-\infty, -1.08) \cup (3.25, \infty)$
D) $(3.25, -1.08)$

248) $3\pi x^2 - 19x + \sqrt{5} > 0$ 248) _____

(Give approximations rounded to the nearest hundredth.)

A) $(-\infty, -1.89) \cup (-0.13, \infty)$
B) $(-1.89, -0.13)$
C) $(-\infty, 1.89) \cup (0.13, \infty)$
D) $(1.89, 0.13)$

249) $\frac{x^2 + 2x - 8}{x^2 - 2x - 48} < 0$ 249) _____

A) $(-6, -4)$ or $(2, \infty)$
B) $(-\infty, -4)$ or $(-6, 8)$
C) $(-6, -4)$ or $(2, 8)$
D) $(-4, 2)$ or $(8, \infty)$

**Solve the problem.**

250) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 22t + 120$. Determine the number of units to be sold in order for $P = 0$ (the break–even point). 250) _____

A) $t = 22$
B) $t = 12$ or $t = 10$
C) $t = -12$ or $t = -10$
D) $t > 12$



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251) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 28t + 180$. Determine the number of units to be sold in order for $P > 0$ (a profit is made). 251) _____

A) $18 < t < 10$ B) $t = 28$ C) $t = 18$ or $t = 10$ D) $t > 18$ or $t < 10$

252) The profit made when t units are sold, $t > 0$, is given by $P = t^2 - 26t + 165$. Determine the number of units to be sold in order for $P < 0$ (a loss is taken). 252) _____

A) $t = 11$ or $t = 15$ B) $t < 11$ or $t > 15$ C) $t > 0$ D) $11 < t < 15$

253) The cost of producing t units is $C = 5t^2 + 5t$, and the revenue generated from sales is $R = 6t^2 + t$. Determine the number of units to be sold in order to generate a profit. 253) _____

A) $t > 4$ B) $t > 0$ C) $t > 6$ D) $t > 5$

254) A rectangular enclosure must have an area of at least 500 $yd^2$. If 120 yd of fencing is to be used, and the width cannot exceed the length, within what limits must the width of the enclosure lie? 254) _____

A) $10 \le w \le 30$ B) $0 \le w \le 10$ C) $10 \le w \le 50$ D) $30 \le w \le 50$

255) A coin is tossed upward from a balcony 252 ft high with an initial velocity of 16 ft/sec. During what interval of time will the coin be at a height of at least 60 ft? ($h = -16t^2 + v_0t + h_0$.) 255) _____

A) $0 \le t \le 1$ B) $3 \le t \le 4$ C) $4 \le t \le 8$ D) $0 \le t \le 4$

256) A retailer knows that n games can be sold in a month if the price is $30 - 0.3n$ dollars per game. If he buys each game for \$3, and if he wishes to make a profit of at least \$600 per month on sales of this game, how many games must he sell each month? 256) _____

A) $40 \le n \le 90$ B) $40 \le n \le 50$ C) $25 \le n \le 45$ D) $25 \le n \le 40$

257) If a rocket is propelled upward from ground level, its height in meters after t seconds is given by $h = -9.8t^2 + 117.6t$. During what interval of time will the rocket be higher than 343 m? 257) _____

A) $0 < t < 5$ B) $5 < t < 7$ C) $7 < t < 10$ D) $10 < t < 12$

258) A flare fired from the bottom of a gorge is visible only when the flare is above the rim. If it is fired with an initial velocity of 192 ft/sec, and the gorge is 560 ft deep, during what interval can the flare be seen? ($h = -16t^2 + v_0t + h_0$.) 258) _____

A) $0 < t < 5$ B) $10 < t < 12$ C) $15 < t < 17$ D) $5 < t < 7$



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1) A
2) B
3) B
4) B
5) B
6) B
7) A
8) A
9) D
10) A
11) D
12) C
13) D
14) C
15) A
16) D
17) D
18) B
19) D
20) A
21) A
22) A
23) D
24) B
25) C
26) C
27) C
28) B
29) B
30) D
31) C
32) C
33) B
34) D
35) C
36) B
37) C
38) D
39) A
40) C
41) D
42) D
43) A
44) A
45) C
46) D
47) B
48) A
49) D
50) D



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51) B
52) A
53) D
54) C
55) A
56) B
57) D
58) B
59) A
60) B
61) D
62) D
63) B
64) D
65) B
66) C
67) C
68) B
69) C
70) B
71) C
72) B
73) C
74) D
75) B
76) C
77) A
78) A
79) C
80) A
81) D
82) D
83) C
84) B
85) B
86) B
87) C
88) C
89) D
90) C
91) A
92) C
93) B
94) A
95) B
96) B
97) B
98) B
99) A
100) B



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101) B
102) C
103) B
104) C
105) C
106) A
107) C
108) D
109) C
110) A
111) C
112) C
113) A
114) D
115) A
116) C
117) D
118) D
119) B
120) B
121) B
122) B
123) B
124) D
125) C
126) B
127) B
128) A
129) A
130) C
131) D
132) D
133) D
134) C
135) A
136) A
137) C
138) C
139) D
140) C
141) C
142) B
143) D
144) A
145) A
146) B
147) D
148) B
149) A
150) B



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151) D
152) A
153) B
154) C
155) D
156) A
157) D
158) A
159) A
160) A
161) B
162) D
163) B
164) A
165) C
166) D
167) B
168) D
169) A
170) D
171) B
172) D
173) A
174) C
175) A
176) A
177) D
178) B
179) D
180) B
181) A
182) C
183) A
184) D
185) C
186) D
187) D
188) B
189) A
190) B
191) A
192) C
193) D
194) B
195) B
196) B
197) D
198) D
199) C
200) A



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201) C
202) B
203) D
204) C
205) B
206) C
207) A
208) A
209) D
210) C
211) C
212) D
213) C
214) B
215) D
216) C
217) C
218) C
219) C
220) C
221) B
222) A
223) B
224) D
225) D
226) B
227) A
228) C
229) C
230) D
231) D
232) B
233) B
234) A
235) A
236) C
237) C
238) C
239) C
240) B
241) D
242) B
243) D
244) B
245) D
246) B
247) D
248) D
249) A
250) B



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251) D
252) D
253) A
254) A
255) D
256) B
257) B
258) D



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