

alg2 Final exam review

1 Evaluate $5v - 3w$ for $v = -5$ and $w = 2$.

2 Evaluate $4m(3m - 2)$ when $m = -2$.

3 Evaluate $(7 + 5y) \div 3x$ when $x = \frac{1}{6}$ and $y = 3$.

4 Evaluate $(-7 + 5y) \div 3x$ when $x = -3$ and $y = 5$.

5 Evaluate $(7 + y) \div 10x$ when $x = 2$ and $y = 43$.

6 Evaluate $14.70 - 17.54z$ when $z = 2$.

7 Evaluate $\frac{42 - z}{-2z + 4}$ when $z = -2$.

8 Evaluate $3a^3 + (3a)^2$ when $a = -3$.

9

Evaluate $2a^3 + (2a)^3$ when $a = -3$.

Simplify the expression.

10 $-2 + 5z + 8z + 9$

11 Use the distributive property to simplify: $-(-3x + 2y)$

12 A car's gas tank holds 16 gallons of gas and the car gets 24 miles per gallon when driving on the highway.

a. Write an expression for the amount of gas left in the tank after driving x miles on the highway.

b. For what values of x does your expression make sense? Explain.

Solve the equation. Check your solution.

13 $-6x + 9 = -21$

14 $-\frac{r}{10} + 5 = 12$

15 Jeff earns \$4.00 an hour baby-sitting. He is saving to buy a pair of in-line skates that costs \$116.00. If Jeff already has \$60.00 saved, how many hours must he baby-sit in order to buy the skates?

16 An awards dinner costs \$225 plus \$5 for each person making reservations. The total bill is \$735. How many people made reservations?

17 Solve the equation. $-3x + 5 = 7x + 8$

Solve the equation:

18 $6z + 3 = 8z - 5$

Solve the equation:

19 $7z + 5 = 9z - 3$

20 Which equation below is an identity? Which has no solutions?

A. $10(x + 3) + 8 = 18x + 30$

B. $16n - 20 = 4(5n + 1)$

C. $12(c + 3) - 30 = 12c + 36$

D. $4(6a + 3) = 6(4a + 2)$

21 Which equation is an identity? Which equation has no solutions?

A. $15(p + 3) + 12 = 27p + 45$

B. $6(6t + 3) = 9(4t + 2)$

C. $24m - 30 = 2(15 + 3)$

D. $18(w + 3) - 45 = 18 + 54$

Solve:

22 $\frac{9x}{3} + 11x = 28$

Solve:

23 $-\frac{21x}{7} - 5x = 24$

Solve the equation:

24 $4n - 2(3 - n) = -13$

Solve the equation:

25 $\frac{1}{2}(y + 1) = 9$

26 $\frac{1}{4}(y + 3) = 7$

Solve the equation:

27 $\frac{x}{2} + \frac{x}{4} = 5$

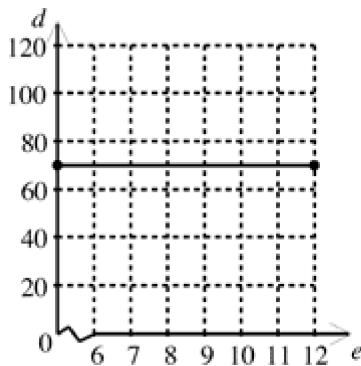
- 28 A person is able to burn 7 calories per minute on an exercise bike and 10 calories per minute on a rowing machine.
- This person spends a total of 1 hour exercising on the bike and the rowing machine and burns a total of 525 calories. Write and solve an equation to find how long the person spent riding the exercise bike.
 - How would your answer change if the total number of calories burned were 555? Explain.

29 Find the range of the relation $\{(4, 3), (1, 5), (-5, -3)\}$.

- 30 Determine whether the relation is a function.
(0, 4), (1, 4), (2, 5), (3, 6), (4, 6)

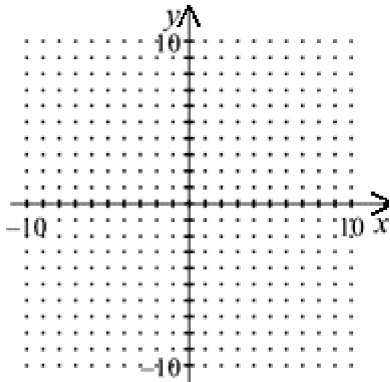
- 31 Determine whether the relation is a function.
(4, 0), (4, 1), (5, 2), (6, 3), (6, 4)

- 32 What is the range of the function in the graph?



Graph:

33 $y = -\frac{3}{4}x + 3$



34 Find the slope and y-intercept of the line. $5x - 4y = 20$

35 Find the slope and y-intercept of the line. $4x - 3y = 36$

Graph:

36 $y = 1$

37 Write an equation of a line that has slope -5 and y-intercept 2 .

Write an equation of the line with the given slope and y-intercept. Express your answer in slope-intercept form.

38 slope = -2 ; y-intercept = -4

Write an equation of the line that is perpendicular to the given line and passes through the given point. Express your answer in slope-intercept form.

39 $y = -2x + 6$; $(0, -5)$

40 Find the slope-intercept equation of the line passing through the points $(-5, -3)$ and $(-2, 6)$.

41 A rental car costs \$25 plus a fixed charge per mile driven. The total charge for 320 miles of use was \$89. Write an equation for the cost, C (in dollars), in terms of the miles driven, x .

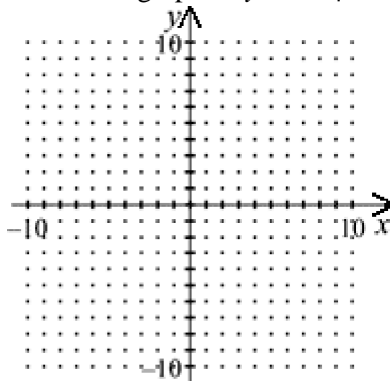
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42 Graph the equation. $y = |x + 2| - 2$



43 Sketch the graph of $y + 4 = |x - 5|$.

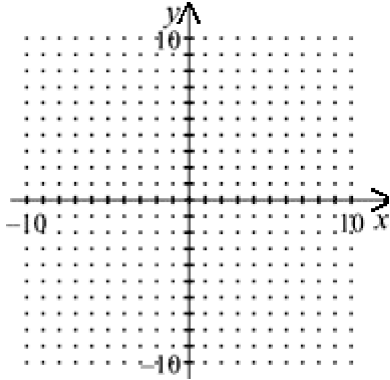


44 Graph the function. $f(x) = 3 - |x - 2|$

45 Graph the equation. $y = \frac{1}{2} |x - 2|$

Solve the system by graphing.

46 $x + y = 4$
 $2x - y = -7$



47 Is $(5, -2)$ a solution of the system?
 $2x + 6y = -2$
 $2x + y = 6$

Sketch the graph of the system. Estimate the solution.

48 $2x - 3y + 6 = 0$
 $5x - 2y - 7 = 0$

49 $3x - 2y = -7$
 $x + y = 1$

50 A rental car agency charges \$18 per day plus 13 cents per mile to rent a certain car. Another agency charges \$22 per day plus 9 cents per mile to rent the same car. How many miles per day will have to be driven for the cost of a car from the first agency to equal the cost of a car from the second agency?

Solve the linear system.

51 $3x + 4y = 4$
 $3x + y = 10$

52 $4x + 5y = 6$
 $3x - 5y = 22$

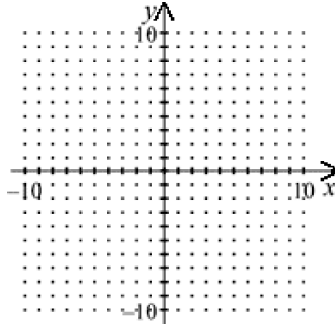
53 $y = -\frac{3}{4}x + \frac{1}{4}$
 $y = \frac{3}{4}x - \frac{3}{4}$

54 $3x + 4y = -3$
 $2x + y = 8$

55 $4x - 3y = -1$
 $3x + 4y = -3$

Graph the system of inequalities.

56 $x \geq 1$
 $y \leq -5$



Sketch the graph of the system of linear inequalities.

57 $2x + 1 \geq 0$
 $3y - 6 > 0$

58 Write and graph a system of inequalities in which x and y are each greater than -3 , but not greater than 2 .

59 Write and graph a system of inequalities in which x and y are each less than 4 and not negative.

60 Write and graph a system of inequalities in which x and y are each less than 3 , but not less than -2 .

61 Does the parabola open *up* or *down*? $y = 4 + 6x - 2x^2$

62 Does the parabola open *up* or *down*? $y = -7 - 5x + 3x^2$

Find the maximum value or minimum value for the function.

63 $f(x) = x^2 + 7x + 5$

64 You are enclosing a rectangular portion of your lawn with a limited amount of fencing. You want to maximize the amount of area enclosed by this amount of fencing. Find the ratio of length to width of the rectangle with maximum area. Describe the rectangle.

Find the zeros of the equation.

65 $x^2 + 4x - 5 = y$

Factor.

66 $64x^2 - 9$

Simplify the expression.

67 $\sqrt{18}$

68 Solve the equation. $\frac{1}{3}x^2 + 1 = 33$

69 Solve the equation. Round the solutions to two decimal places. $5x^2 - 2 = 7$

70 The height, h (in feet), of a falling object on Mars is given by $h = -6t^2 + s$, where t is the time in seconds and s is the initial height in feet. If an object were dropped from a height of 125 feet, how long would it take to reach the ground? (Round to two decimal places.)

71 Solve the equation $(2x - \sqrt{3})(2x + \sqrt{3}) = 13$.

72 Solve the equation. $4x^2 + 20 = 0$

73 Solve the equation. $4x^2 + 5 = -7$

Write the expression as a complex number in standard form.

74 $(-2 + 4i) - (3 + 9i)$

75 $(5 - 2i) - 2(3 + i)$

76 $(5 - 2i) + (3 - 2i)$

77 $(-3 + 7i)(1 - 2i)$

78 $\frac{-2 - 4i}{7i}$

Find the absolute value of the complex number.

79 $1 + 3i$

80 $-2 + i$

81 Write the expression $(5 + 7i)(5 - 7i)$ as a complex number in standard form.

82 Solve by the quadratic formula: $4x^2 - 8x + 1 = 0$

83 Use the quadratic formula to solve the equation. $x^2 + 2x - 1 = 0$

84 Use the quadratic formula to solve the equation. $3x^2 + x - 1 = 0$

85 State the discriminant of the quadratic. $5x^2 - 3x - 12 = 0$

86 State the discriminant of the quadratic. $3x^2 - 4x + 4 = 0$

87 State the discriminant of the quadratic. $10x^2 - 7x - 3 = 0$

88 Use the discriminant to determine the number of real solutions of the equation. $4x^2 - 3x - 7 = 0$

89 Use the discriminant to determine the number of real solutions of the equation. $5x^2 - 3x + 1 = 0$

90 Use the discriminant to determine the number of real solutions of the equation. $9x^2 - 30x + 25 = 0$

Simplify the expression.

91 $(bc^3)^4$

92 $(-3x^{-2})^3$

93 $(-2x^{-3})^2$

94 $\frac{6x^2}{y^3} \cdot \frac{y^{-2}x^3}{9x^2}$

95 During a year when there were about 2.2×10^8 people in the United States, the average person consumed approximately 25 quarts of ice cream. Estimate the total number of quarts of ice cream consumed in the United States during that year. Write your answer in scientific notation.**Find the sum or difference.**

96 $(-7x^2 + 3) + (4x^2 + 2x - 1)$

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97 $(3x + 7) - (5x^2 - 6x + 2)$

98 $(2x + 5) - (3x^2 + 7x - 5)$

Find the product.

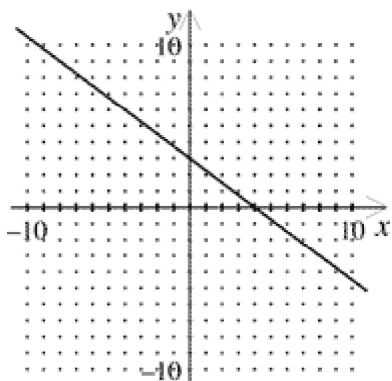
99 $(x + 1)(x^2 + 4x + 5)$

100 $(4x - 1)(3x^2 - 2x - 4)$

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Answer Section

- 1 -31
 2 64
 3 44
 4 -2
 5 $\frac{5}{2}$
 6 -20.38
 7 5.5 or $\frac{11}{2}$
 8 0
 9 -270
 10 $7 + 13z$
 11 $3x - 2y$
 12 a. $16 - \frac{x}{24}$
 b. The expression makes sense for $0 < x < 384$ because the number of miles traveled must be non-negative and the car will run out of gas after 384 miles unless more gas is added.
- 13 5
 14 -70
 15 14 hours
 16 102
 17 $x = -\frac{3}{10}$
 18 4
 19 4
 20 D; C
 21 B; D
 22 $x = 2$
 23 $x = -3$
 24 $-\frac{7}{6}$
 25 17
 26 25
 27 $\frac{20}{3}$
 28 a. $7x + 10(60 - x) = 525$; $x = 25$ minutes on the exercise bike.
 b. The amount of time spent on the bike would decrease to 15 minutes. The person would have to spend more time on the rowing machine because the person is able to burn more calories per minute there.
- 29 $\{3, 5, -3\}$
 30 It is.
 31 It is not.

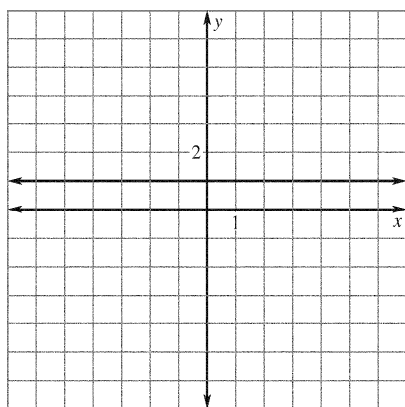
32 $d = 70$



33

34 slope = $\frac{5}{4}$; y-intercept = (0, -5)

35 slope = $\frac{4}{3}$; y-intercept = (0, -12)



36

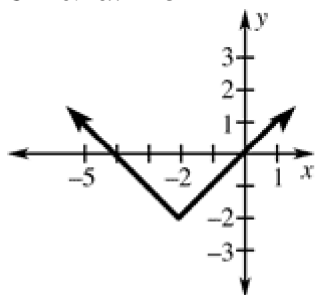
37 $y = -5x + 2$

38 $y = -2x - 4$

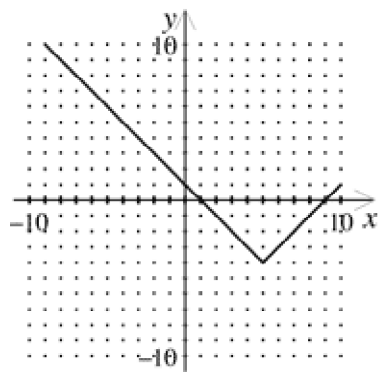
39 $y = \frac{1}{2}x - 5$

40 $y = 3x + 12$

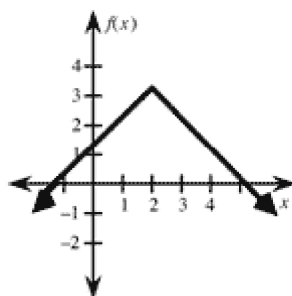
41 $C = 0.20x + 25$



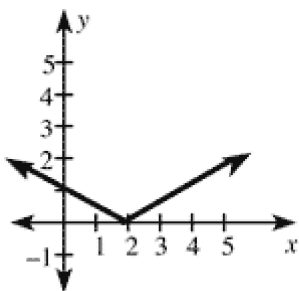
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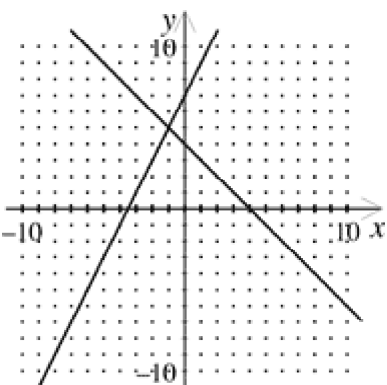
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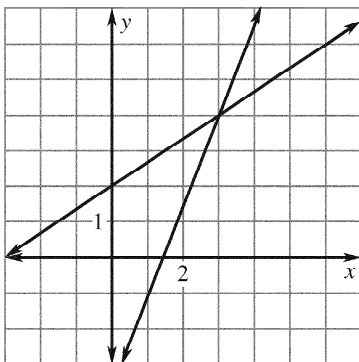


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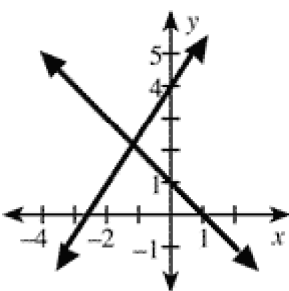
$(-1, 5)$

47 no

48 (3, 4)



49 (-1, 2)



50 100 miles per day

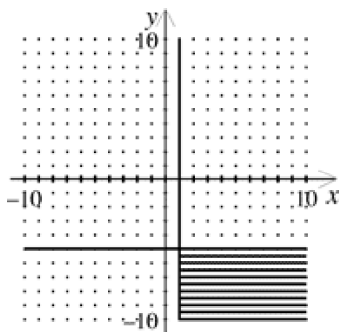
51 (4, -2)

52 (4, -2)

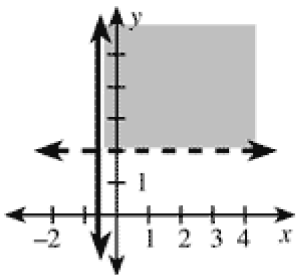
53 $\left(\frac{2}{3}, -\frac{1}{4}\right)$

54 (7, -6)

55 $\left(-\frac{13}{25}, -\frac{9}{25}\right)$

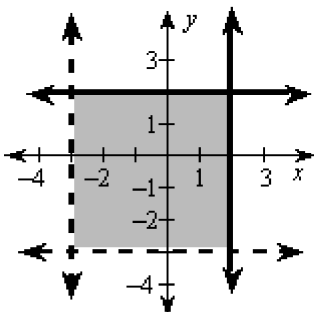


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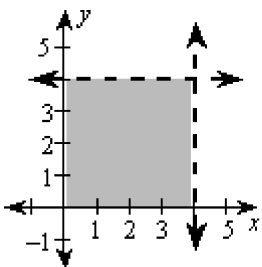


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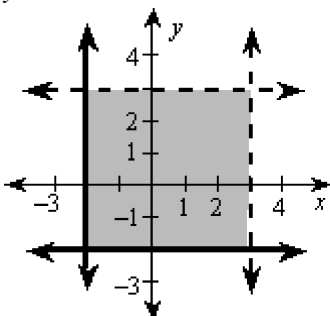
- 58 $x > -3$
 $x \leq 2$
 $y > -3$
 $y \leq 2$



- 59 $x < 4$
 $x \geq 0$
 $y < 4$
 $y \geq 0$



- 60 $x < 3$
 $x \geq -2$
 $y < 3$
 $y \geq -2$



- 61 Down
 62 Up

- 63 minimum: -7.25
- 64 $\frac{l}{w} = 1$; the rectangle with maximum area is a square.
- 65 $-5, 1$
- 66 $(8x + 3)(8x - 3)$
- 67 $3\sqrt{2}$
- 68 $\pm 4\sqrt{6}$
- 69 ± 1.34
- 70 4.56 seconds
- 71 $x = 2$ or $x = -2$
- 72 $\pm i\sqrt{5}$
- 73 $\pm i\sqrt{3}$
- 74 $-5 - 5i$
- 75 $-1 - 4i$
- 76 $8 - 4i$
- 77 $11 + 13i$
- 78 $-\frac{4}{7} + \frac{2i}{7}$
- 79 3.16
- 80 2.24
- 81 74
- 82 $\frac{2 - \sqrt{3}}{2}, \frac{2 + \sqrt{3}}{2}$
- 83 $-1 \pm \sqrt{2}$
- 84 $-\frac{1}{6} \pm \frac{\sqrt{13}}{6}$
- 85 249
- 86 -32
- 87 169
- 88 2
- 89 None
- 90 One
- 91 $b^4 c^{12}$
- 92 $-\frac{27}{x^6}$
- 93 $\frac{4}{x^6}$
- 94 $\frac{2x^3}{3y^5}$
- 95 about 5.5×10^9 qt
- 96 $-3x^2 + 2x + 2$

97 $-5x^2 + 9x + 5$

98 $-3x^2 - 5x + 10$

99 $x^3 + 5x^2 + 9x + 5$

100 $12x^3 - 11x^2 - 14x + 4$