kNAME: _____ DATE: _____ CLASS: _____
ALGEBRA 2 SUMMER MATH 2019-2020

Complete this assignment if you will be taking Algebra 2 next school year (2019-2020).
Bring this completed and corrected assignment with you the first day of class.

DIRECTIONS: ***(Please read and follow these directions.)***
A] Refer to your Algebra 1 and geometry notebook or the internet for assistance. Do your own work.
B] Do not wait until the last minute to complete this assignment.
C] Write neatly and in pencil on your own paper. Number all work as it is numbered in this packet.
D] Show your work (step-by-step solutions). Circle your final answers.
E] Simplify fractions and radicals. Round decimal answers to the nearest hundredth.
F] Draw graphs on graph paper. Plot the points to the graph.
G] Answers will be posted the first week of August.
A test on this material will be given during the first week of the semester.
This test will be the first grade of the course.

Perform the indicated operation. Leave answers in simplest fraction form. Show your work.

1. $\frac{1}{2} \cdot \frac{9}{14}$

2. $2\frac{1}{6} + \frac{1}{4}$

3. $\frac{2}{9} - \frac{1}{6}$

4. $\frac{1}{7} \div \frac{9}{28}$

Solve the proportion.

5. A fruit stand charges \$3 for 4 pounds of assorted fruits. How much would 20 pounds of assorted fruits cost?

Simplify the expression.

6. $(-4 + 3^2)(2 - 6)^3$

7. $2^2 - 4(-4 + 2) - 6$

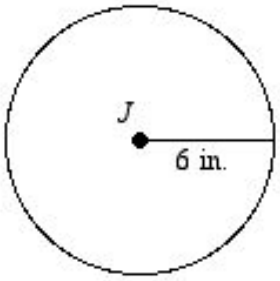
8. In which quadrant is the point $(-2, 4)$?

Use an equation to solve the percent problem.

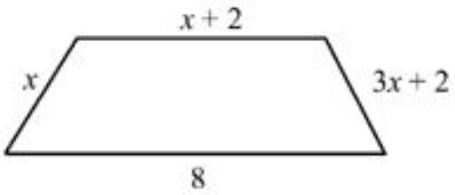
9. There are 1,348 people under the age 20 in Pierce City. This represents 11% of the total population. What is the total population?

Find the area of the figure. Round to the nearest whole inch.

10.



11. The trapezoid below has a perimeter of 20. Solve for x



Write the expression so that all exponents are positive.

12. $wx^{-4}y^{8}z^{-3}$

Simplify the expression using only positive exponents.

13. $\dfrac{(xy^5)(x^5y)}{(x^6y)^3}$

Simplify. Write the answer in standard form.

14. $(g-4)(g+2)$

Use the calculator to find the product or quotient. Write the answer in scientific notation and in standard form. Round to the appropriate number of significant digits.

15. $\left(3.3 \times 10^{3}\right) \div \left(5.64 \times 10^{5}\right)$

a. 5.64×10^{8}; 0.00564
b. 590×10^{2}; 590
c. 5.9×10^{-3}; 0.0059
d. 1.861×10^{-3}; 0.001861

16. The number of patients treated at Dr. Walters's dentist office each day was recorded for eight days. Use the data 17, 9, 13, 9, 6, 2, 3, 12 to find the mean, median, and mode for this sample.

17. Barb walked 1.3 miles to her friend's house and then $\frac{3}{4}$ mile to the library. How far did Barb walk in all?

a. $1\frac{9}{40}$ miles
b. $1\frac{3}{7}$ miles
c. $2\frac{1}{20}$ miles
d. $2\frac{1}{10}$ miles

18. On average, a dog runs 5.5 times faster than a child. Which equation can be used to find s, the speed of a dog, given r, the speed of the child?

a. $s = 5.5r$
b. $s = \frac{5.5}{r}$
c. $s = r + 5.5$
d. $s = \frac{r}{5.5}$

19. What is the slope and y-intercept of the equation $6x - 1 = 3y - 10$?

a. $m = 2, b = 3$
b. $m = 2, b = -3$
c. $m = 3, b = 4$
d. $m = 6, b = 9$

20. Aleta went to dinner. The bill was \$36. She gave the waiter a 15% tip. What was the total amount Aleta spend on the food and the tip?

a. \$36.15
b. \$37.50
c. \$38.40
d. \$41.40

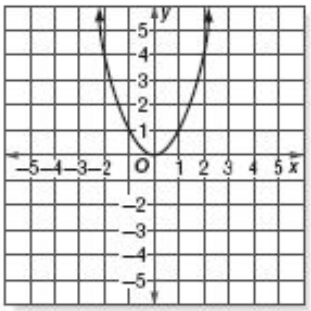
21. What is true concerning the lines graphed by the system of equations shown below?

$$\begin{cases} 8x + 6 = 2y \\ 12x - 3 = 3y \end{cases}$$

a. The lines intersect.
b. The lines are perpendicular.
c. The lines are parallel.
d. The lines are the same.

22. Which shows the graph of $y = x^2$? What type of function is this?

a.



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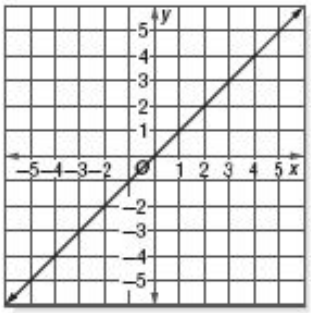

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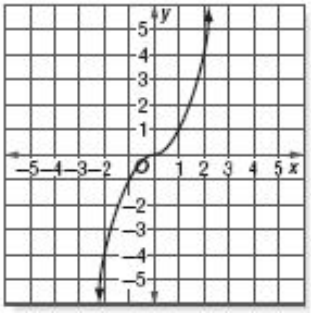

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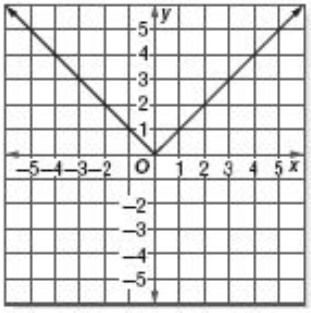


23. Simplify the expression $4(2x-1)-3(x+5)$.

a. $3x-19$ b. $5x-16$ c. $5x-19$ d. $9x-2$

24. What is the slope of a line that passes through $(4,-1)$ and $(2,9)$?

a. $\frac{3}{7}$ b. $-\frac{5}{7}$ c. -5 d. -4

25. Which is an equation of the line that has a slope of $\frac{1}{2}$ and passes through the point $(3,-1)$?

a. $x+2y=1$ b. $x+2y=-1$ c. $x-2y=5$ d. $x-2y=8$

26. What is the x-intercept of the graph of $3x-4y=12$?

a. -4 b. -3 c. 3 d. 4

27. The sum of two numbers is 27. The larger number is 6 more than twice the smaller number. Which system of equations can be used to find the two numbers?

a. $xy=27$
$y=6+x$

b. $x+y=27$
$y=6+x$

c. $x+y=27$
$y=6+2x$

d. $xy=27$
$y=6+2x$

28. The line $y = mx + 7$ is perpendicular to the line $y = \frac{3}{4}x - 9$. What is m?

a. $\frac{3}{4}$ b. $-\frac{3}{4}$ c. $\frac{4}{3}$ d. $-\frac{4}{3}$

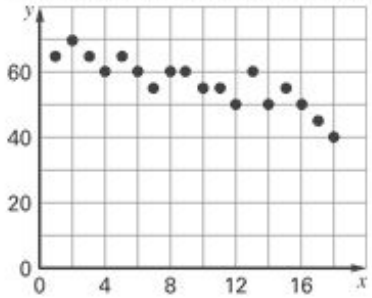
29. What is the value of the expression $x^3 - 2y^2$ for $x = -4$ and $y = -5$?

a. -114 b. -14 c. 14 d. 114

30. The formula $K = \frac{1}{2}mv^2$ gives the kinetic energy K of an object in terms of its mass m and velocity v. What is the equation for m?

a. $m = \frac{1}{2}Kv^2$ b. $m = \frac{\sqrt{2K}}{v}$ c. $m = \frac{2v^2}{K}$ d. $m = \frac{2K}{v^2}$

31. Which linear equation approximates the best fit to the data?



a. $y = -2x + 65$ b. $y = -5x + 100$ c. $y = -x + 68$ d. $y = -0.5x + 55$

The variables x and y vary directly. Use the given values to write an equation that relates x and y.

32. $x = -6, y = 42$

Solve the equation.

33. $\frac{25x}{5} - 7x = 12$

34. $\frac{1}{4}(3y + 2) = 7$

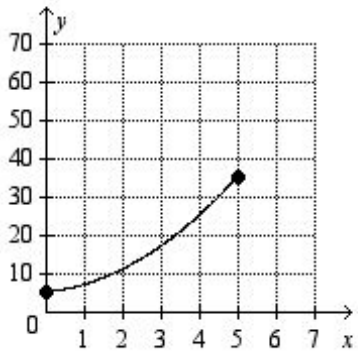
35. $7x - 29 - 21x = 3 - (12 + 2x)$

36. $\frac{3}{x-4} = \frac{5}{x}$

Solve the equation. Round the solution to two decimal places.

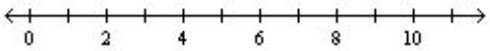
37. $14.2y - 12.5 = 6.4y - 13.7$

38. What is the domain and range of the function in the graph?



Solve and graph.

39. $-10w + 5 < -30$



40. Solve $y = \frac{5}{8}b + 10$ for b.

a. $b = -\frac{8}{5}y + 16$ b. $b = \frac{8}{5}y - 16$ c. $b = \frac{5}{8}y - 10$ d. $b = -\frac{5}{8}y + 10$

41. On a road in the city of Rochester, the maximum speed is 50 miles per hour and the minimum speed is 20 miles per hour. If x represents speed, which sentence best expresses this condition?

a. $50 \geq x - 20$ b. $50 \geq x \leq 20$ c. $50 \geq x \geq 20$ d. $50 \leq x \leq 20$

42. Which of the following functions is linear?

a. $f(x) = 3x - 25$ b. $f(x) = 3x^2 - 25$ c. $f(x) = \frac{7}{3x - 25}$ d. $f(x) = 25 + 3x^{1/4}$

43. Solve by substitution:

$3x + 2y = -4$

$y = 4x - 2$

a. $(0, -2)$ b. no solution c. $(2, 6)$ d. $(-1, -\frac{1}{2})$

44. Solve the linear system by any method.

$3x - 2y = 3$

$6x + 2y = 3$

45. Which equation is an identity? Which has no solutions?

$10(x+3)+8=18x+30$
$16n-20=4(5n+1)$
$12(c+3)-30=12c+36$
$4(6a+3)=6(4a+2)$

46. Use elimination to solve the linear system.

$3x-4y=21$
$4x+2y=6$

Describe the solution(s) of the system.

47. $6x+4y=10$

$18x+12y=-20$

a. no solution b. (–7, 13) c. (7, –8) d. (–1, 4)

48. Which choice best describes the solution(s) of the system of equations?

$-24x+8y=24$
$-15x+5y=15$

a. many solutions
b. (–1, 0) is the only solution.
c. (1, 48) is the only solution.
d. no solution

Find the sum or difference.

49. $\left(x^2+2x+1\right)+\left(4x^2+5x+3\right)$

Factor the expression.

50. $x^2 - 8x + 16$

Factor the expression.

51. $5x^2 - 42x + 16$

Factor the expression.

52. $-2n^2 + 16n - 24$

53. Simplify $\sqrt{90}$.

a. $3\sqrt{10}$
b. 12
c. $9\sqrt{10}$
d. 45

Factor the expression.

54. $x^2 + 20x + 100$

Factor the expression.

55. $16x^2 - 25$

56. Write as a product of factors.
$12x^2 + 25x + 12$

57. Solve by factoring: $x^2 - 18x + 81 = 0$

Solve.

58. $4x^2 - 12x - 16 = 0$

Simplify the expression.

59. $\sqrt{72}$

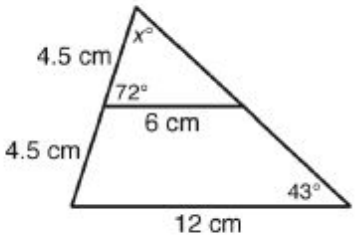
60. The ratio of the measures of two supplementary angles is 8 : 4. What is the measure of the smaller angle?

a. 12°
b. 40°
c. 60°
d. 80°

61. To the nearest tenth, what is the distance between the points $(10, -11)$ and $(-1, -5)$?

a. 2.6
b. 4.1
c. 12.5
d. 18.4

62. What is the value of x?



a. 25 b. 29 c. 65 d. 115

63. Which CANNOT be used to prove that a quadrilateral is a parallelogram?
a. One pair of opposite angles is congruent.
b. Both pairs of opposite sides are parallel.
c. Both pairs of opposite sides are congruent.
d. One pair of opposite sides is both parallel and congruent.

64. When the angle of elevation to the sun is $26°$, a flagpole casts a shadow that is 82 feet long. What is the height of the flagpole to the nearest foot?
a. 36 ft b. 40 ft c. 74 ft d. 166 ft

65. 40% of what number is 24?
a. 0.6 b. 9.6 c. 60 d. 960

66. What is the simple interest earned on \$300 over 6 years at 4% interest?
a. \$72.00 b. \$79.60 c. \$379.60 d. \$1872.00

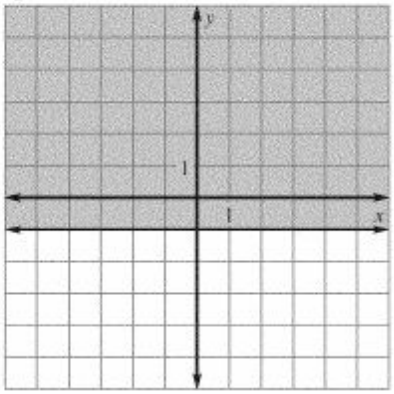
67. Classify $x^3 - 3x^2 + 12$ according to its degree and number of terms.
a. cubic binomial b. cubic trinomial c. quadratic binomial d. quadratic trinomial

68. The area of a square is $16x^2 + 24x + 9$. Which is an equivalent expression for the area of the square?
a. $(4x-3)^2$ b. $(4x+3)^2$ c. $(4x-9x+3)^2$ d. $(4x+9x+3)^2$

Graph.

69. $x \geq -1$

a.



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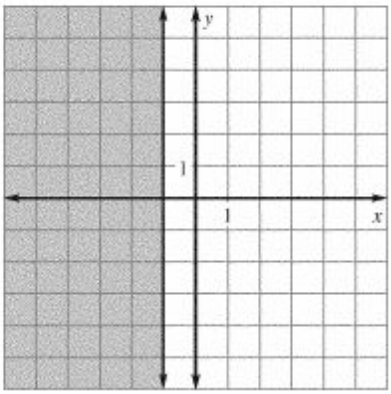

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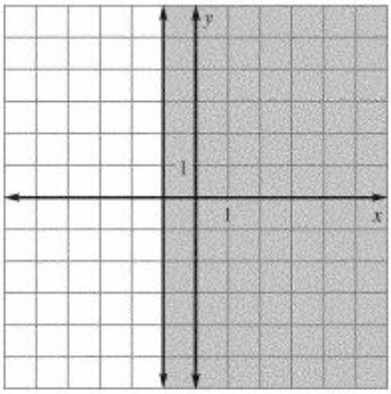

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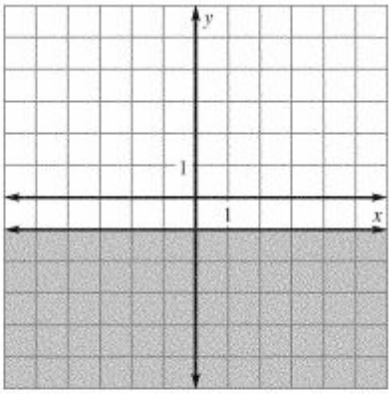
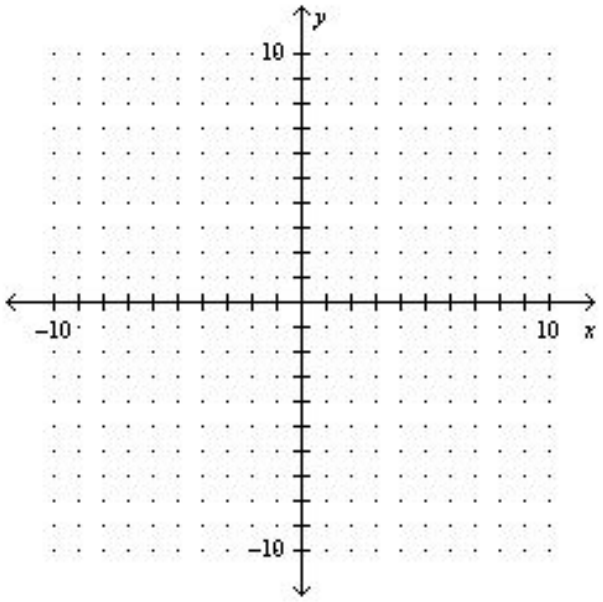


70. $y \leq 4x + 4$

71. Find the solution to the system by graphing.

$x + y = 0$

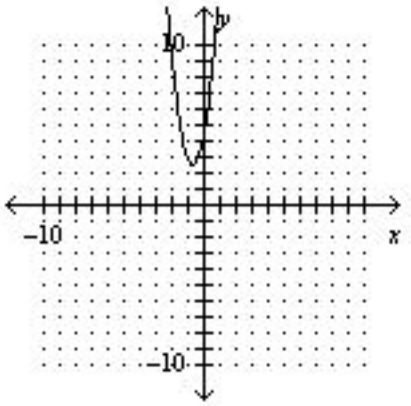
$2x - y = -9$



Graph:

72. $y=4x^2+5x+4$

a.



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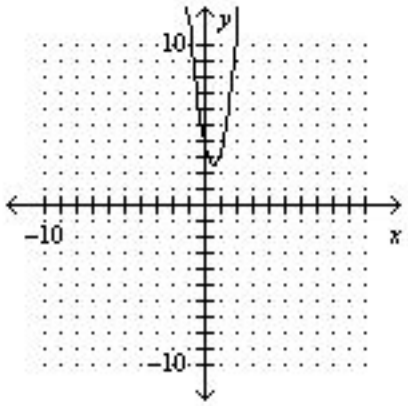

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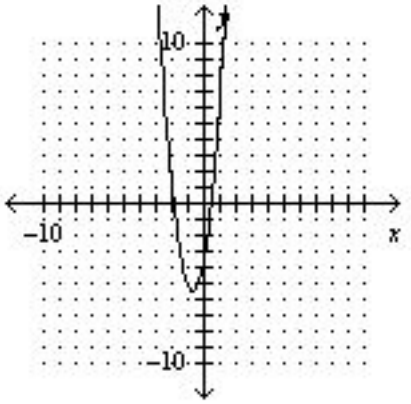

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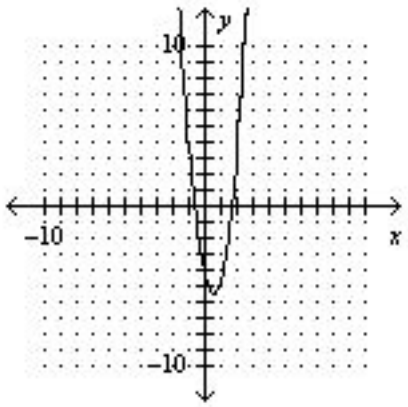

73. Simplify. $\frac{4}{\sqrt{24}}$

74. Find the length of the hypotenuse of a 45-45-90 triangle with a leg of 12 inches.

75. Find the length of the leg of a 45-45-90 triangle with a hypotenuse of 28 cm.

76. Find the lengths of the short leg and long leg of a 30-60-90 triangle with a hypotenuse of 15 m.

77. Find the length of the short leg and the hypotenuse of a 30-60-90 triangle with a long leg of 9 inches.

SOLVE EQUATIONS BY FACTORING

Example: $3x^2+14x+8=0$

$(3x+2)(x+4)=0$

$3x+2=0$ or $x+4=0$

$x=-2/3$ or $x=-4$

Solve by factoring:

1) $x^2+5x-6=0$

2) $x^2-7x-18=0$

3) $x^2=20x-36$

4) $x^2+8x=20$

5) $4x^2+15=17x$

6) $3x^2-13x-10=0$

7) $6x^2+11x-10=0$

8) $8x^2+10x-25=0$