



2019-2020

Bishop Kelley High School

Summer Math Program

Course: Algebra II Honors

NAME: _____

DIRECTIONS:

- Show all work on loose-leaf paper, which you will turn in with the packet. **(No work in Packet)**
- Put final answer in the packet.
- This material will be collected, graded, and points awarded at the discretion of each teacher on the first day of the math class.
- A test on this material will be administered during the first week of the class.
- An additional resource for help with this packet is <http://www.khanacademy.org>. It provides videos of about 10 minutes in length on hundreds of different math topics.

A teacher will be available the following dates/ times if you need help. ROOM C-1

Wed., July 24, 8-9:30

Mon., July 29, 8-9:30

Tues., July 30, 8-9:30

1. Evaluate the expression for the given value of the variable.

$$6y + 7 \text{ when } y = 3$$

2. Find the distance traveled using $d = rt$.

A bird flies at a rate of 6 miles per hour for 30 minutes.

3. Evaluate the expression for the given value of the variable.

$$16 + 12x - x^3 \text{ when } x = 3$$

4. Evaluate the expression for the given values of the variables.

$$\frac{45 - 1}{x + 2y^2} \cdot 2 \text{ when } x = 6 \text{ and } y = 2$$

5. Mario plans to paint baskets. The paint costs \$14.75. The baskets cost \$7.75 each. Write an equation that models the cost, C , for x baskets. Determine the cost of two baskets.

6. Which of the functions represents the input-output table? (**Circle the correct Function**)

Input	Output
0	9
1	12
2	15
3	18

Functions
$y = 3x - 9$
$y = 3x + 9$
$y = 3x - 10$
$y = 4x + 9$

7. What is the opposite of 48?

8. Use the rules of addition to find the sum.

$$28.43 + (-13.17) + |2.07|$$

9. Find the difference.

$$(-8) - (-4)$$

10. Determine whether the statement is *true* or *false*. If it is false, give a counterexample. The product of $(-s) \cdot (2)$ is always negative.

11. Use the Distributive Property to rewrite the expression without parentheses.
 $17x(3x - 5)$

12. Simplify the expression.

$$\frac{56a - 16}{8}$$

13. Choose the linear equation. **(Circle Your Answer)**

[A] $2s - 46 = 14$

[B] $3r^2 = 16 - r$

[C] $16 = f^2$

[D] $(k + 3)^2 = 17$

Solve the equation.

14. $\frac{3}{8}x = 96$

15. $4x + 8 = 21$

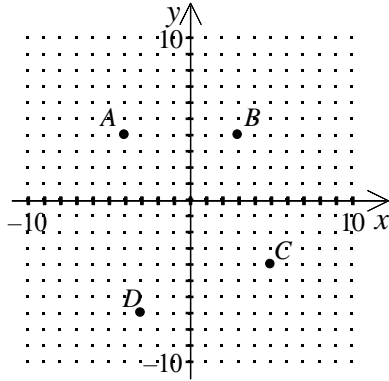
16. The Fahrenheit and Celsius scales are related by the equation $F = \frac{9}{5}C + 32$. What temperature Celsius would give the body temperature of 98.6°F ?

17. Solve the equation. $4 + 3(x - 1) = 2(x - 2)$

18. One hiking club charges \$20 to become a member and \$5 to participate on each hike. Another club charges no membership fee, but charges \$7 to participate on each hike. How many hikes must you go on to make the first club more economical?

19. Give answers to one decimal place where needed.
 What is 18% of 180 miles?

20. Write the ordered pairs that correspond to the given points.

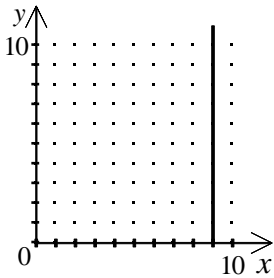


A _____, B _____, C _____, D _____

21. Complete the table. Then graph the equation. (Put Answers in Table)

x	-3	-2	0	2	3
$y = -\frac{4}{5}x + 4$					

22. Write the equation for this graph.



23. Find the x - and y -intercepts of: $y = -7x + 3$.

_____, _____

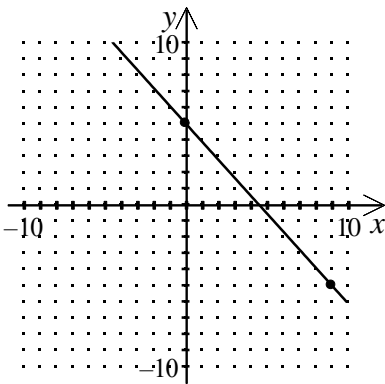
24. A ski-lift runs to the top of a hill at a slope of: $\frac{3}{5}$. The horizontal distance from the bottom of the lift to the center of the mountain is 4000 feet. How high is the hill?

25. Write an equation for the variation and find the quantity indicated.
 x varies directly with y . If x is 104 when y is 130, find x when y is 190.

26. Find the slope and y-intercept of the line $y = 6x + 13$. Is the line parallel to $y = 6x + 12$?

_____, _____
 _____, _____
 Parallel? _____

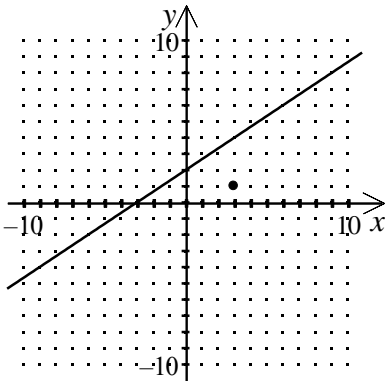
27. Write an equation of the line shown in slope-intercept form.



28. The cost of a school banquet is \$90 plus \$11 per person attending. Determine the linear equation that models this problem. What is the cost for 40 people?

29. Write an equation in point-slope form of the line. Then rewrite the equation in the slope-intercept form. The line that passes through the point $(4, -5)$ and has the slope $\frac{2}{3}$.

30. Write in slope-intercept form the equation of the line that is parallel to the line in the graph and passes through the given point.



31. Write the standard form of the equation ($Ax + By = C$) of the line with slope -3 passing through the point $(5, -5)$.

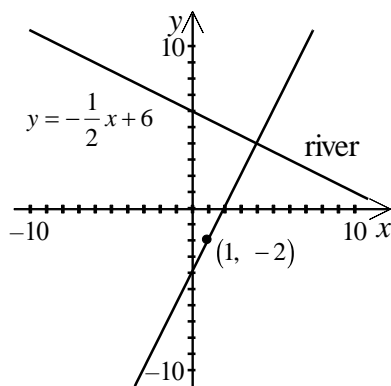
32. A basketball team scored 65 points in a playoff game. Each field goal is 2 points and each free throw is 1 point.

- A. Write a linear model for the number of points the team scored in terms of goals, x , and free throws, y . _____
- B. Write the equation in the slope-intercept form. _____
- C. Use the linear equation to complete the table.

# of field goals	6	12	18	24
# of free throws				

(Complete Table)

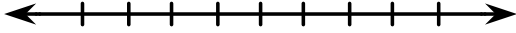
33. You are walking to a river as shown in the graph below. The shortest path is one that is perpendicular to the river. Find the equation for this path. **(Circle your Answer)**



- [A] $y = \frac{1}{2}x - 4$
- [B] $y = 2x - 4$
- [C] $y = -2x - 4$
- [D] $y = -4x + 2$

34. Solve the inequality. Then graph the solution. **(Use the Graph Provided)**

$$x + 6 < 9$$



35. Solve the inequality.

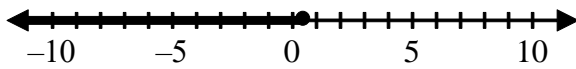
$$-\frac{1}{3}x < 7$$

36. Select the appropriate graph of the solution of the inequality.

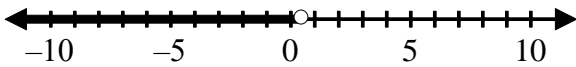
$$4x - 5 < 2(x - 2)$$

(Circle Your Answer)

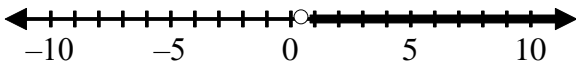
[A]



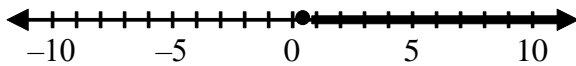
[B]



[C]



[D]



37. Solve the inequality.

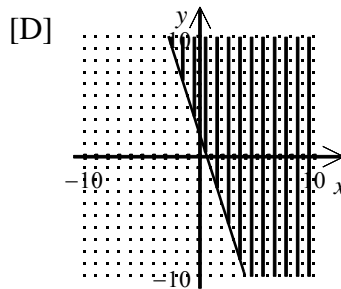
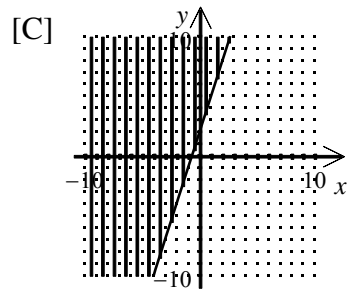
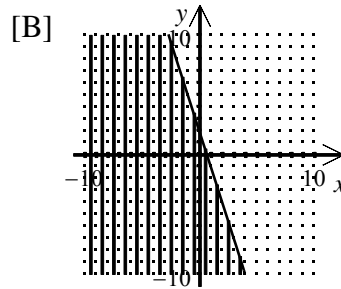
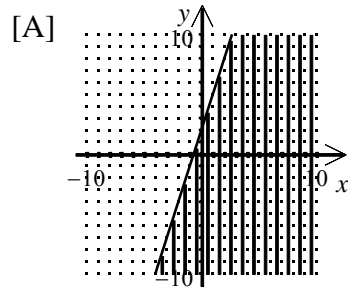
$$4 < 2(1 - 3x) < 10$$

38. Solve the absolute-value equation.

$$|x + 1| = 5$$

39. Choose the graph that shows the solution to the inequality. **(Circle Your Answer)**

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



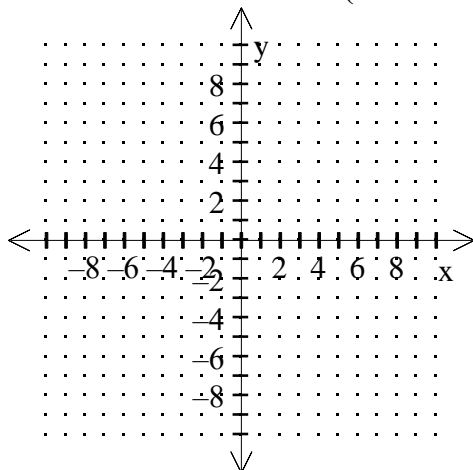
40. A wholesaler has \$75,000 to spend on certain models of TV sets and VCRs. If the TV sets may be obtained at \$375 each and the VCRs at \$215 each, write an inequality that restricts the purchase of x TVs and y VCRs.

41. Find the solution to the system by graphing. Use a straight edge to draw straight lines.

$$x + y = -5$$

$$3x - y = 1$$

(Use the Graph Provided)

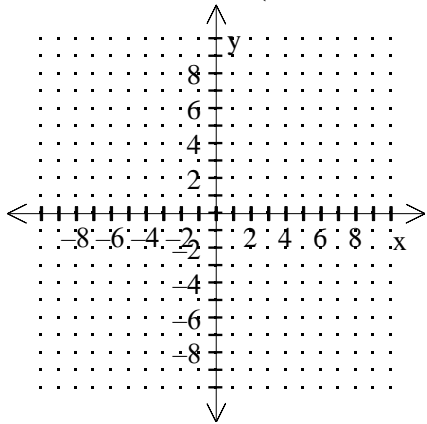


42. Estimate the solution of the linear system graphically. Then check the solution algebraically.

$$x + y = 2$$

$$2x - y = -8$$

(Use the Graph Provided)



Use substitution to solve the linear system.

43. $y = 4x + 2$

$$y = 5x$$

Use substitution to solve the linear system.

44. $3x - 2y = -1$

$$y = -x + 8$$

45. The length of a rectangle is 8 centimeters more than two times the width. If the perimeter of the rectangle is 34 centimeters, what are the dimensions? **(Circle Your Answer)**

[A] width = 6 cm, length = 28 cm

[B] width = 3 cm, length = 28 cm

[C] width = 3 cm, length = 14 cm

[D] width = 6 cm, length = 20 cm

46. A group of 60 people attend a ball game. There were four times as many children as adults in the group. Write a system of equations that you could use to solve this problem, where a is the number of adults and c is the number of children in the group. Solve the system of equations for c , the number of children in the group. **(Must show ALL your Work on this Problem)**

47. Mr. Frankel bought 5 tickets to a puppet show and spent \$21. He bought a combination of child tickets for \$3 each and adult tickets for \$5 each. Which system of equations will determine the number of adult tickets, a , and the number of child tickets, c , he bought?

(Circle Your Answer)

[A] $a + c = 105$, $a + c = 5$

[B] $5a + 3c = 21$, $a + c = 5$

[C] $3a + 3c = 26$, $a + c = 5$

[D] $a = c - 5$, $5a + 3c = 21$

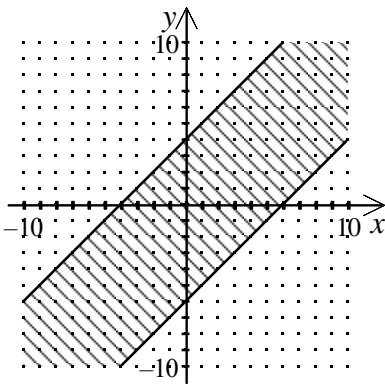
48. Determine if the system has no solutions, one solution, or many solutions.

$$2x + y = 8$$

$$8x + 4y = 32$$

49. James sold three different types of magazine subscriptions for \$12, \$11, and \$18. He sold one fewer of the \$12 subscriptions than of the \$11 subscriptions and a total of 24 subscriptions. If his total sales were \$347, how many \$18 subscriptions did James sell?

50. Write a system of linear inequalities that defines the shaded region.



51. Simplify the expression.

$$(2x)^4(3x^3)^2$$

52. Solve for x .

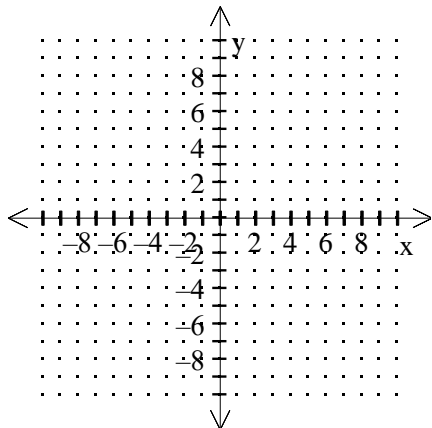
$$3^2 \cdot 3^4 \cdot 3^5 = 3^x$$

53. Rewrite the expression using positive exponents.

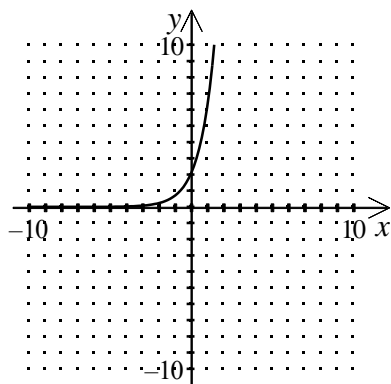
$$\frac{1}{9x^{-2}y^{-1}}$$

54. Graph the function. (Use the Graph Provided)

$$y = 3^x$$



55. Use the graph to find the domain and range of the function: $y = 2 \cdot 3^x$.



- [A] The domain is all real numbers and the range is all real numbers greater than 2.
- [B] The domain is all real numbers and the range is all positive real numbers.
- [C] The domain is all real numbers greater than -2 and the range is all positive real numbers.
- [D] The domain is all real numbers and the range is all real numbers greater than or equal to 0.

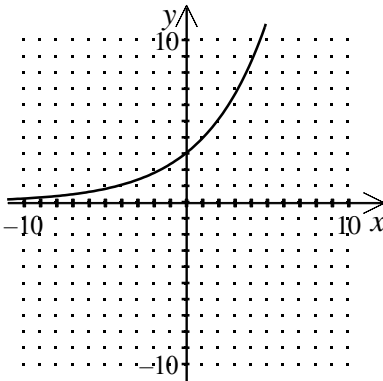
56. Write the number in scientific notation.

0.000900

57. Divide by first converting each number to scientific notation form. Write the answer in scientific notation form. $\frac{1200}{0.0006}$

58. A scientist found that the number of bacteria in a culture doubled every hour. If there were 5000 bacteria at 2:00 A.M., how many bacteria were there at 11:00 A.M.?

59. What is the equation of the graph?



[A] $y = (3 \cdot 1.3)^x$ [B] $y = 1.3(0.3)^x$ [C] $y = 1.3(3)^x$ [D] $y = 3(1.3)^x$

60. Choose the equation that represents *exponential decay*. (**Circle Your Answer**)

A. $y = (0.89)^t$ B. $y = (2.16)^t$

61. Evaluate the expression.

$$-\sqrt{1}$$

62. Solve the equation or write *no real solution*.

$$x^2 = 9$$

Simplify the expression in radical form.

$$63. -\sqrt{\frac{9}{36}}$$

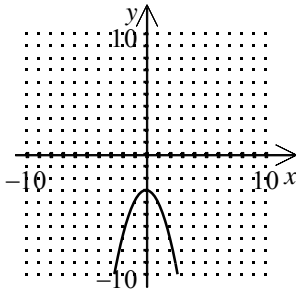
Simplify the expression in radical form.

64. $\sqrt{80}$

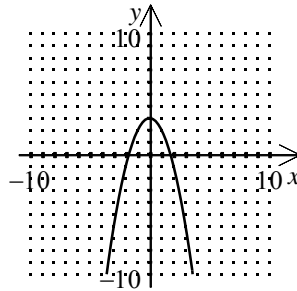
65. Graph the equation. **(Circle Your Answer)**

$$y = x^2 + 3$$

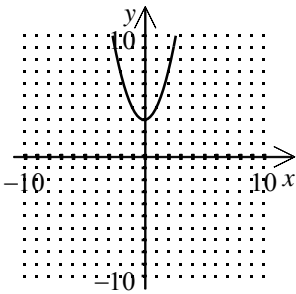
[A]



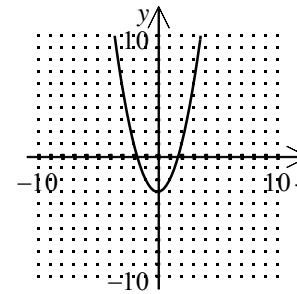
[B]



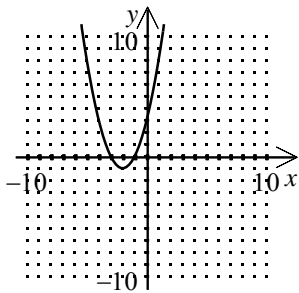
[C]



[D]



66. Identify the roots and choose the correct quadratic function represented by the graph below. **(Circle Your Answer)**



[A] the roots are 1 and -3; $x^2 + 3x + 4 = 0$

[B] the roots are 1 and 3; $-x^2 + 4x + 3 = 0$

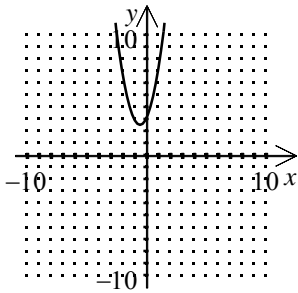
[C] the roots are -1 and -3; $x^2 + 4x + 3 = 0$

[D] the roots are -1 and 3; $-x^2 + 3x + 3 = 0$

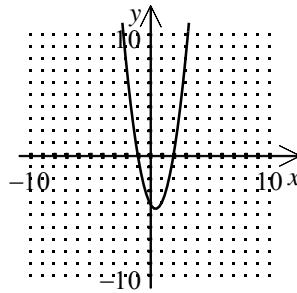
67. Match the equation to its graph. (Circle your Answer)

$$2x^2 + 2x + 3$$

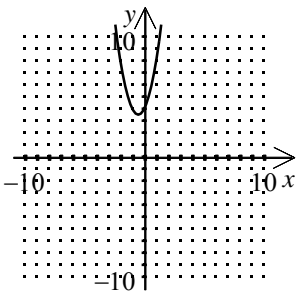
[A]



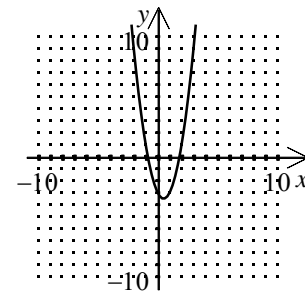
[B]



[C]



[D]



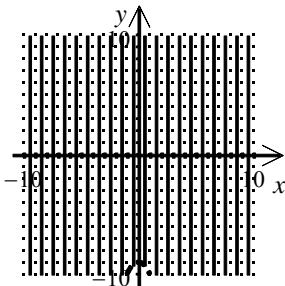
68. Decide whether the point is a solution for the inequality.

$$y \geq -2x^2 + 5x + 7, \quad (-2, 10)$$

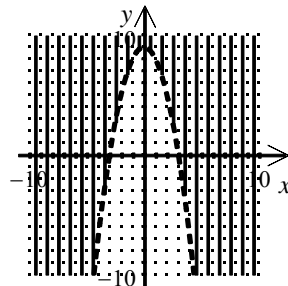
69. Graph the inequality.

$$y > -x^2 + 9 \quad \text{(Circle Your Answer)}$$

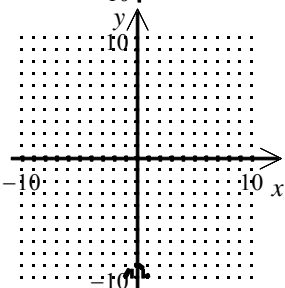
[A]



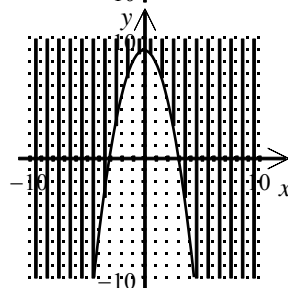
[B]



[C]



[D]



70. An arrow shot into the air is modeled by the equation $y = 128t - 16t^2$, where y = feet above the ground and t = seconds after it is released. Graph the equation to find what period of time the arrow is above 240 feet. **(Circle Your Answer)**

- [A] between 6 and 10 seconds [B] between 3 and 3 seconds
 [C] between 3 and 10 seconds [D] between 3 and 5 seconds

71. Classify $1 - 2b^3$ and state its degree. **(Circle Your Answer)**

- [A] binomial, 3 [B] monomial, 5 [C] binomial, 1 [D] trinomial, 2

72. Use a vertical or horizontal format to add or subtract.

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

73. Find the product.

$$-z^2(3 - z - 2z^2)$$

74. Use the FOIL pattern to find the product.

$$(x + 2)(x - 6)$$

75. The sides of a rectangle have length $x + 5$ and width $x - 3$. Which equation describes the area, A , of the rectangle in terms of x ? **(Circle Your Answer)**

- [A] $A = 4x + 4$ [B] $A = x + 2$ [C] $A = x^2 + 8x - 15$ [D] $A = x^2 + 2x - 15$

76. Find the product.

$$(4p + 9)(4p - 9)$$

Use the zero-product property to solve the equation.

77. $(x + 2)(x + 5) = 0$

78. $(x + 1)(2x - 2) = 0$

79. Factor the expression.

$$x^2 - 6x + 8$$

80. Solve the equation.

$$3x - 7x^2 = 0$$

81. Solve the equation. Check your solutions.

$$\frac{x-1}{3} = \frac{x+5}{x-1}$$

82. The weight, W , of a beam varies *directly* with its length, l . A 10-foot beam weighs 530 pounds. Write an equation relating W to l .

83. Simplify the expression.

$$\frac{x^2 + 4x}{x^2 - 16}$$

84. Find the quotient.

Divide $(x^2 + 8x + 12)$ by $(x + 2)$.

85. Write the product in simplest form.

$$\frac{16x^6}{9x^4} \cdot \frac{15x}{8x^2}$$

86. Write the quotient in simplest form.

$$\frac{x+8}{x-8} \div \frac{x^2-64}{x-8}$$

87. Simplify the expression.

$$\frac{4x-10}{y} + \frac{2x+2}{y}$$

88. Write the sum in simplest form.

$$\frac{x^2 + 3}{6x^3} + \frac{3x - 4}{12x^2}$$

89. Solve the equation by cross multiplying.

$$\frac{x - 1}{x - 9} = \frac{x + 8}{x - 7}$$

90. Solve the equation by multiplying each side by the least common denominator.

$$\frac{x}{6} - \frac{x}{12} = 6$$

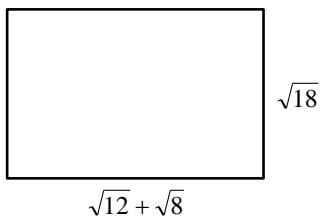
Simplify the expression. **(Leave Answer in Radical Form)**

91. $9\sqrt{6} + 9\sqrt{6} - 3\sqrt{6}$

92. $(2\sqrt{6} + \sqrt{5})(2\sqrt{6} - \sqrt{5})$

93. $\sqrt{\frac{98}{27}}$

94. Find the area of the rectangle.



95. Solve the equation.

$$\sqrt{1-2x} = -4$$

96. Simplify the expression.

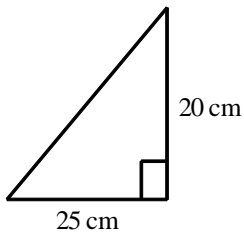
$$(x^{1/4})^8 (y^{12} x^4 \sqrt{x^{16}})^{1/2}$$

97. Solve by completing the square.

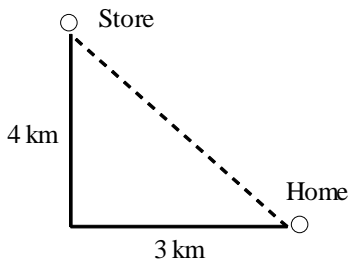
$$3x^2 - 4x - 4 = 0$$

98. Given the right triangle below, what is the length of the hypotenuse?

(Leave Answer in Radical Form)



99. To get to the store from his house, Barry jogged 3 kilometers due west and then 4 kilometers due north. On the way back he cut across a field, taking the shortest possible route home.



How far did Barry jog on the round-trip? **(Circle Your Answer)**

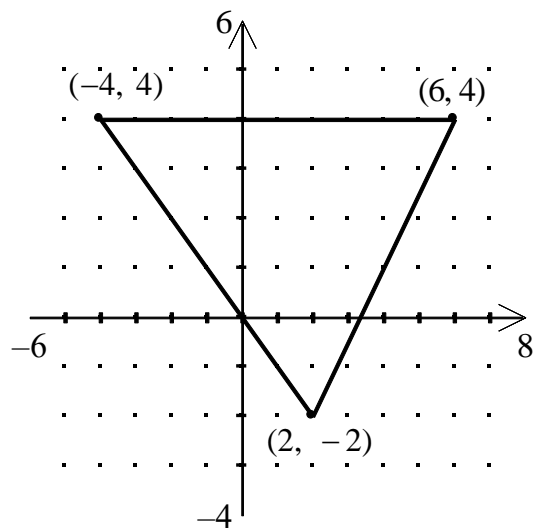
[A] 12 km

[B] 5 km

[C] 7 km

[D] 14 km

100. Find the midpoint of each side of the triangle.



_____ , _____ , _____