

Student: _____
Date: _____

Instructor: Jorge Martinez
Course: ALGEBRA 2

Assignment: SUMMER PACKET #1 -
ADVANCED TOPICS MATHEMATICS

1. SUMMER PACKET INSTRUCTIONS

WELCOME TO YOUR NEXT MATH CLASS

To get ready and to not lose your math "fitness," the following questions in this packet are for you to do a little at a time. Do 5 or 10 per day perhaps, but don't wait until the night before returning to school to do ALL questions. This is like trying to eat a 50 pizzas at the same time! This packet will be graded on accuracy and completeness when you return to school. The packet is due on the 2nd day of school.

Relax and see you in August.

- MR. MARTINEZ WISHES FOR ME TO HAVE GREAT SUMMER!!!!!!
-

2. Identify a pattern and find the next three numbers.

9, 18, 27, 36, ...

Find the next three numbers.

9, 18, 27, 36, _____, _____, _____, ...

3. Identify a pattern and find the next three numbers.

3, 6, 10, 15, ...

Find the next three numbers.

3, 6, 10, 15, _____, _____, _____, ...

4. Identify the property illustrated by the equation.

$$6 \cdot (4 \cdot 2) = (6 \cdot 4) \cdot 2$$

Choose the correct answer below.

- associative property of multiplication
 commutative property of multiplication
 associative property of addition
 identity property of multiplication
-

5. Classify the variable according to the set of numbers that best describes its values.

the day d for which an appointment is scheduled

Choose the correct answer below.

- irrational numbers
 natural numbers
 rational numbers
 integers
-

6. Insert either < or > between the pair of numbers to make a true statement.

$$\sqrt{5} \quad 1.4$$

$$\sqrt{5} \quad \underline{\hspace{2cm}} \quad 1.4$$

7. State the name of the property illustrated.

$$\sqrt{5} + \sqrt{3} = \sqrt{3} + \sqrt{5}$$

Choose the correct answer below.

- Distributive property
 - Associative property of addition
 - Commutative property of addition
 - Commutative property of multiplication
 - Associative property of multiplication
-

8. Name the property that the following statement illustrates.

$$25 \cdot \pi = \pi \cdot 25$$

Choose the correct property below.

- A. Commutative property of multiplication
 - B. Identity property of addition
 - C. Identity property of multiplication
 - D. Associative property of addition
 - E. Associative property of multiplication
 - F. Commutative property of addition
-

9. State the name of the property illustrated.

$$7 + 3 = 3 + 7$$

Choose the correct answer below.

- Commutative property of addition
 - Associative property of addition
 - Commutative property of multiplication
 - Associative property of multiplication
 - Distributive property
-

10. Choose the property that justifies the following statement.

$$\frac{1}{10} \cdot 10 = 1$$

-
- commutative property of multiplication
- distributive property of multiplication over addition
- identity property of multiplication
- inverse property of multiplication
-

11. Write the numbers in decreasing order.

$$-18, -2.98, -5\sqrt{5}, 3.21, \frac{9}{2}$$

Choose the correct answer below.

- A. $\frac{9}{2}, 3.21, -2.98, -5\sqrt{5}, -18$
- B. $3.21, \frac{9}{2}, -18, -2.98, -5\sqrt{5}$
- C. $-18, -5\sqrt{5}, -2.98, 3.21, \frac{9}{2}$
- D. $-5\sqrt{5}, -18, \frac{9}{2}, 3.21, -2.98$
-

12. Write an algebraic expression that models the word phrase.

the sum of the product of a number x and 11, and 7

Choose the correct answer below.

- A. $77 + x$
- B. $7x + 11$
- C. $(11 + 7)x$
- D. $11x + 7$
-

13. Evaluate the expression for $x = -1$ and $y = 3$.

$$2x - 4y$$

$$2x - 4y = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a decimal.)

14. Translate to an algebraic expression.

37 more than b

The translation is .

15. Write an algebraic expression that models the word phrase. The algebraic expression is _____.

the product of 8 and the sum of a number x and 13

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

$$-k^2 - (7k - 8n) + 3n; k = -3 \text{ and } n = -5$$

For $k = -3$ and $n = -5$, $-k^2 - (7k - 8n) + 3n =$ _____.

(Simplify your answer.)

17. Simplify by combining like terms.

$$4r - 7r + 8 + r$$

$$4r - 7r + 8 + r =$$

18. Simplify the following expression by combining like terms.

$$2x + 3x^2 - 4x + 6x^2$$

$$2x + 3x^2 - 4x + 6x^2 =$$
 _____ (Type a simplified expression.)

19. Simplify by combining like terms.

$$7x^3 + 9x + \frac{x^3}{4} - 9x$$

$$7x^3 + 9x + \frac{x^3}{4} - 9x =$$
 _____ (Use integers or fractions for any numbers in the expression.)

20. Solve the equation.

$$w - 14 = 4.7$$

$$w =$$

(Simplify your answer. Type an integer or a decimal.)

21. Solve the equation for k .

$$4k - 2z = 8$$

$$k =$$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

22. What is the solution of $x - 17 = 1$?

$$x =$$

23. Solve the equation.

$$-\frac{x}{2} = 26$$

$$x =$$
 _____ (Simplify your answer.)

24. Solve the equation. Check your solution.

$$3 + 6q = 4 + 5q$$

q = _____

25. Solve the equation. Check your solution.

$$9x - 2 = 21x + 6$$

x = _____ (Simplify your answer. Type an integer or a simplified fraction.)

26. Solve the equation. Check your answer.

$$8y - 4 - 3y + 1 = 0$$

y = _____
(Simplify your answer. Type an integer or a fraction.)

27. Translate to an inequality. Use the variable x for next year's salary.

My salary next year will be at least \$32,000.

Choose the correct inequality.

- A. $\$32,000 \geq x$
 - B. $x \geq \$32,000$
 - C. $x < \$32,000$
 - D. $x > \$32,000$
-

28. Write the inequality that represents the following sentence.

The sum of a number and 6 is less than -12.

Choose the correct answer below.

- A. $x - 6 < -12$
 - B. $x + 6 \geq -12$
 - C. $x - 6 > -12$
 - D. $x + 6 < -12$
 - E. $x + 6 > -12$
 - F. $x - 6 \leq -12$
 - G. $x + 6 \leq -12$
 - H. $x - 6 \geq -12$
-

29. Write the inequality that represents the sentence, "Seven less than a number is greater than 57."

Choose the correct answer below.

- A. $x - 7 > 57$
 - B. $x + 7 > 57$
 - C. $x - 7 \geq 57$
 - D. $x + 7 \geq 57$
-

30. Is the inequality always, sometimes, or never true?

$$6x - 5 < 6(x - 2)$$

Choose the correct answer below.

- Always true
 Sometimes true
 Never true

31. Is the inequality always, sometimes, or never true?

$$5x - 11 < 5(x - 4)$$

Choose the correct answer below.

- Sometimes true
 Always true
 Never true

32. Solve the equation. Check your answer.

$$|-9x| = 18$$

x = _____

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

33. Solve the equation. Check for extraneous solutions.

$$|x - 3| = 5x + 9$$

x = _____

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

34. Solve.

$$|2x| = 6$$

x = _____

(Simplify your answer. Type an integer or a fraction. Use commas to separate answers as needed.)

35. Solve the equation. Check your answer.

$$|-7x| = 56$$

x = _____

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

36. Write the compound inequality as an absolute value inequality.

$$1.2 \leq h \leq 2.2$$

$1.2 \leq h \leq 2.2$ is equivalent to $|\underline{\hspace{2cm}}|$ (1) $\underline{\hspace{2cm}}$.

(Use integers or decimals for any numbers in the inequality.)

- (1) \geq
 \leq

37. List the domain and range of the relation.

$\{(2, -2), (9,9), (0, -2), (9,1) (2,2)\}$

The domain is $\{\underline{\hspace{2cm}}\}$. (Use a comma to separate answers as needed.)

The range is $\{\underline{\hspace{2cm}}\}$. (Use a comma to separate answers as needed.)

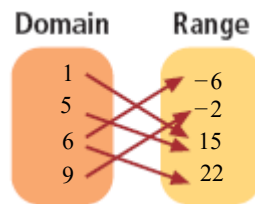
38. Determine whether the relation is a function.

$H = \{(5, -6), (4, -6), (3, -6), (2, -6), (1, -6)\}$

Does the given relation represent a function?

- No
 Yes

39. Determine whether the relation is a function.



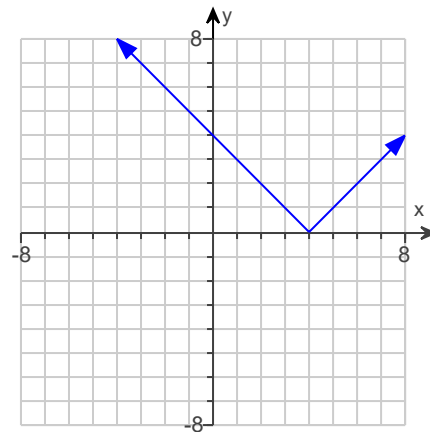
Is the relation a function?

- Yes
 No

40. Determine if the graph is a function.

Is this the graph of a function?

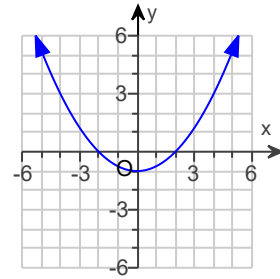
- No
 Yes



41. Given $f(x) = 22x + 12$, find $f(6)$.

$f(6) = \underline{\hspace{2cm}}$

42. Find the domain and range of the relation and determine whether it is a function.



What is the domain of the relation?

- A. $-6 < x < 6$
 B. $-2 < x < 2$
 C. $-1 < x < \infty$
 D. $-\infty < x < \infty$

What is the range of the relation?

- A. $-6 < y < 6$
 B. $-1 \leq y < \infty$
 C. $-2 < y < 2$
 D. $-\infty < y < \infty$

Is the relation a function?

- Yes
 No
-

43. Identify the constant of variation.

$$y = \frac{2}{5}x$$

The constant of variation is $k =$ _____ .
(Type an integer or a fraction.)

44. Identify the constant of variation.

$$4y - 3x = 0$$

The constant of variation is $k =$ _____ .
(Type an integer or a fraction.)

45. Using the slope formula, find the slope of the line through the given points.

$$(6,9) \text{ and } (2,5)$$

What is the slope of the line? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope of the line is _____ . (Type an integer or a simplified fraction.)
 B. The slope of the line is undefined.
-

46. Find the slope of the line through the pair of points.

$$(-10,6) \text{ and } (-1, -1)$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $m =$ _____ (Type an integer or a fraction. Simplify your answer.)
- B. The slope is undefined.

47. Using the slope formula, find the slope of the line through the given points.

$$(-3,2) \text{ and } (4,2)$$

What is the slope of the line? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope of the line is _____. (Type an integer or a simplified fraction.)
- B. The slope of the line is undefined.

48. Write the equation of the line in slope-intercept form.

$$m = \frac{4}{9}, \text{ y-intercept } (0,1)$$

The equation of the line in slope-intercept form is _____.
(Type an equation. Use integers or fractions for any numbers in the equation. Simplify your answer.)

49. Write the equation of the line, with the given properties, in slope-intercept form.

$$\text{Slope} = -7, \text{ through } (-6,8)$$

The equation of the line is _____.
(Type an equation. Use integers or fractions for any numbers in the equation. Type your answer in slope-intercept form. Simplify your answer.)

50. Write in point-slope form an equation of the line through the pair of points.

$$(11,10) \text{ and } (8,6)$$

What is an equation of the line in point-slope form?

- A. $x - 10 = \frac{4}{3}(y - 11)$
- B. $y - 10 = \frac{4}{3}(x - 11)$
- C. $y = -\frac{4}{3}x - \frac{14}{3}$
- D. $y - 10 = -\frac{4}{3}(x - 11)$

51. Find an equation of the line through (4,4) and parallel to $y = 4x - 4$.

$y =$ _____
(Type your answer in slope-intercept form.)

52. Write the equation of the line through the given point. Use slope-intercept form.

$(-8,8)$; perpendicular to $y = -\frac{2}{3}x + 5$

Write an equation for the line in slope-intercept form.

(Simplify your answer. Use integers or fractions for any numbers in the equation.)

53. Make a table of values for the equation. Then graph the equation.

$y = |x + 2| + 3$

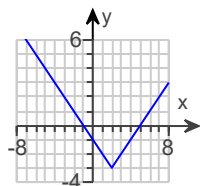
Complete the table of values below.

x	y
-5	_____
-3	_____
-1	_____
0	_____
1	_____
3	_____
5	_____

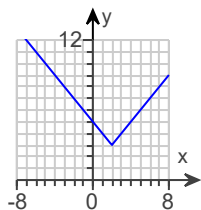
(Simplify your answers.)

Which graph below is the correct graph of the equation?

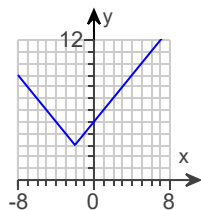
A.



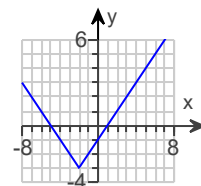
B.



C.



D.

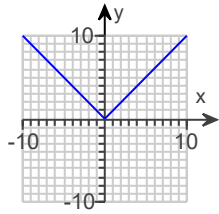


54. Graph the equation. Then describe the transformation from the parent function $f(x) = |x|$.

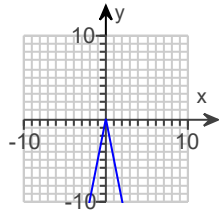
$$y = -5|x|$$

Choose the correct graph below.

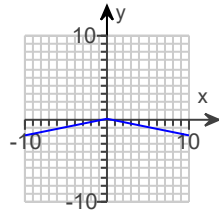
A.



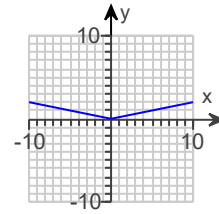
B.



C.



D.

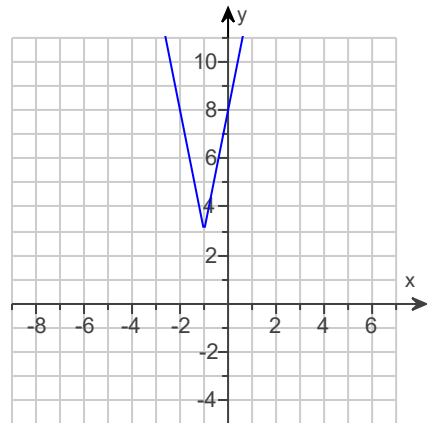


Now describe the transformation from the parent function $f(x) = |x|$. Choose the correct answer below.

- A. The parent function $f(x) = |x|$ is vertically stretched and reflected across the x-axis.
- B. The parent function $f(x) = |x|$ is reflected across the y-axis.
- C. The parent function $f(x) = |x|$ is vertically compressed and reflected across the x-axis.
- D. The parent function $f(x) = |x|$ is reflected across the x-axis.

55. Write an absolute value equation for the graph shown to the right.

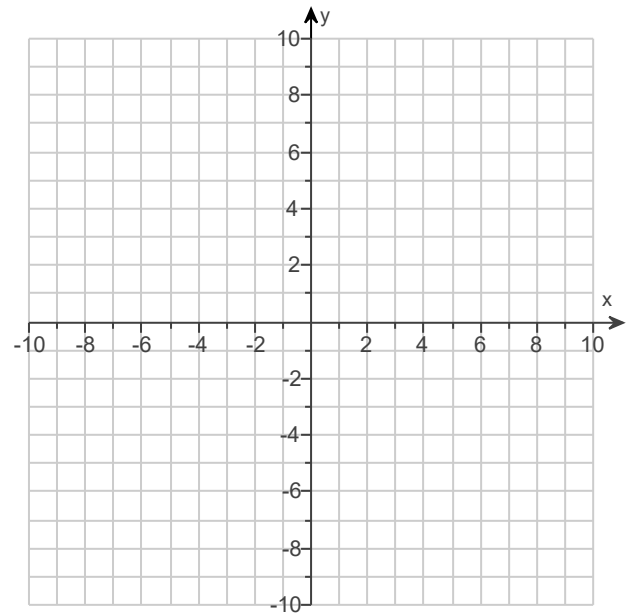
$y =$ _____ (Simplify your answer.)



56. What is the graph of the inequality?

$$4y \leq 6x$$

Use the graphing tool to graph the inequality.

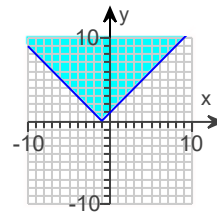


57. What is the graph of the absolute value inequality?

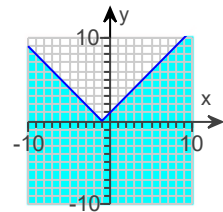
$$y \leq |x + 1|$$

Choose the correct graph to the right.

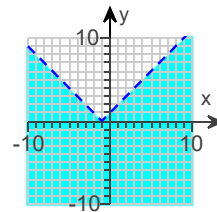
A.



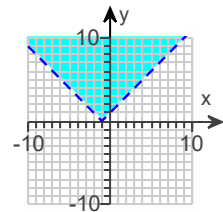
B.



C.



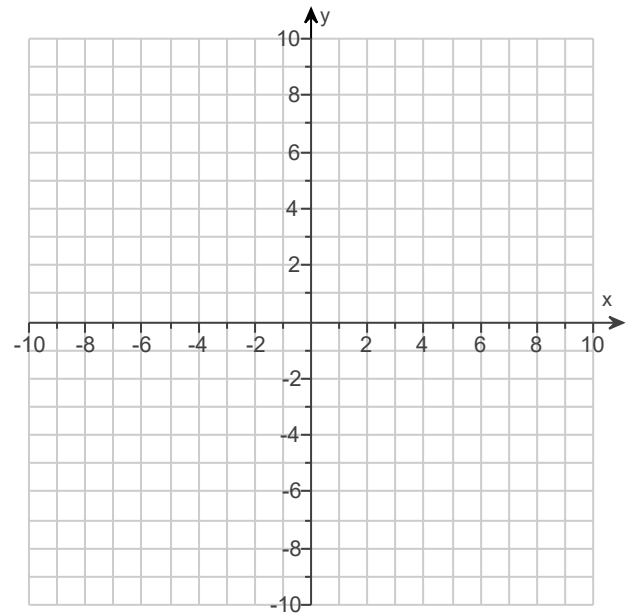
D.



58. Graph the linear inequality.

$$y < x - 2$$

Use the graphing tool to graph the inequality.

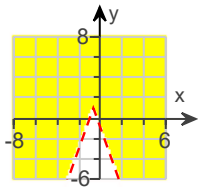


59. Graph the absolute value inequality.

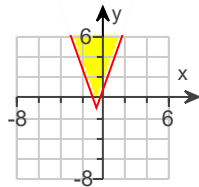
$$1 - y < |3x + 2|$$

Choose the correct graph below.

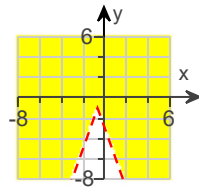
A.



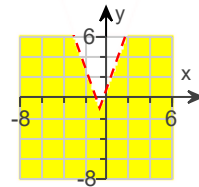
B.



C.



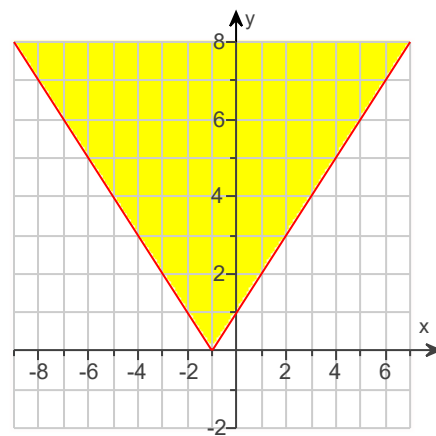
D.



60. Write an inequality for the graph shown to the right. The equation for the boundary line is given below.

$$4y = |4x + 4|$$

y(1) _____ | _____ |



- (1) \leq
 $<$
 \geq
 $>$

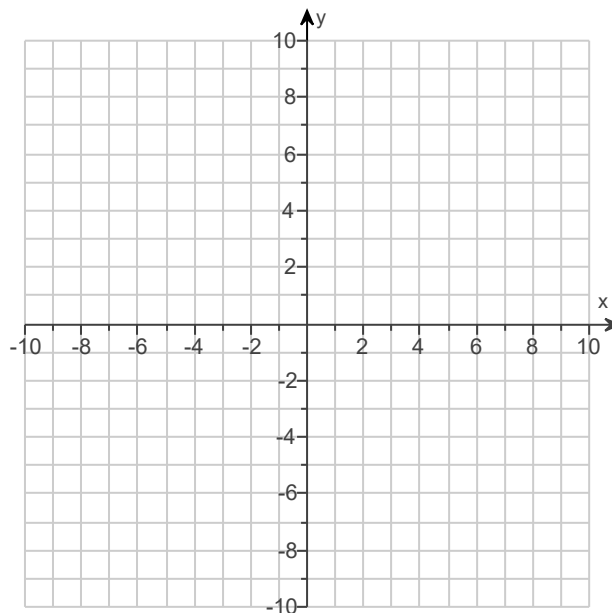
61. Solve the system by graphing.

$$\begin{aligned}y &= x - 3 \\ y &= -x - 5\end{aligned}$$

Graph each equation using the coordinate grid on the right.

What is the solution to the system? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution is _____.
(Type an ordered pair.)
- B. There are infinitely many solutions.
- C. There is no solution.

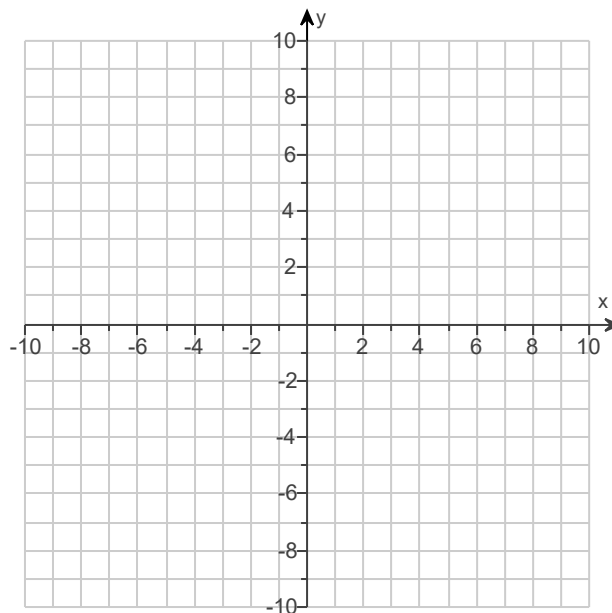


62. Solve the system by graphing.

$$\begin{cases} 2x + 6y = 12 \\ x + y = 4 \end{cases}$$

Use the graphing tool to graph the system.

The solution of the system is _____.
(Simplify your answer. Type an ordered pair.)



63. Solve the system of equations using substitution.

$$\begin{aligned}4x + y &= 12 \\ y &= 2x\end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution is _____.
(Type an ordered pair.)
- B. There are infinitely many solutions.
- C. There is no solution.

64. Solve the system by substitution. Check your answer.

$$\begin{aligned}4x + 3y &= 5 \\ x &= 3y + 5\end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution is _____.
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- B. There are infinitely many solutions.
- C. There is no solution.

65. Solve the system by substitution.

$$\begin{aligned}5x + 7y &= -24 \\ x + 8y &= 15\end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. There is one solution. The solution is _____.
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- B. There are infinitely many solutions.
- C. There is no solution.

66. Solve the system by elimination.

$$\begin{aligned}x + y &= -7 \\ x - y &= -3\end{aligned}$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The solution is _____.
(Simplify your answer. Type an ordered pair.)
- B. There are infinitely many solutions.
- C. There is no solution.

67. Solve the system using elimination.

$$\begin{cases} 4x + 7y = 4 \\ 3x - 7y = 3 \end{cases}$$

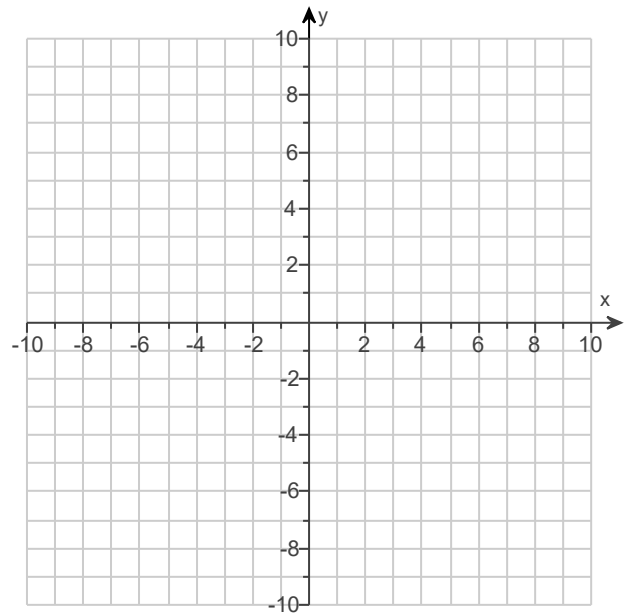
Select the correct choice below and fill in any answer boxes in your choice.

- A. The solution is _____. (Type an ordered pair.)
- B. There are infinitely many solutions.
- C. There is no solution.
-

68. Graph the solution set of the system.

$$\begin{aligned} -2x - y &\geq 6 \\ y &\geq -8 \\ x &\geq -6 \end{aligned}$$

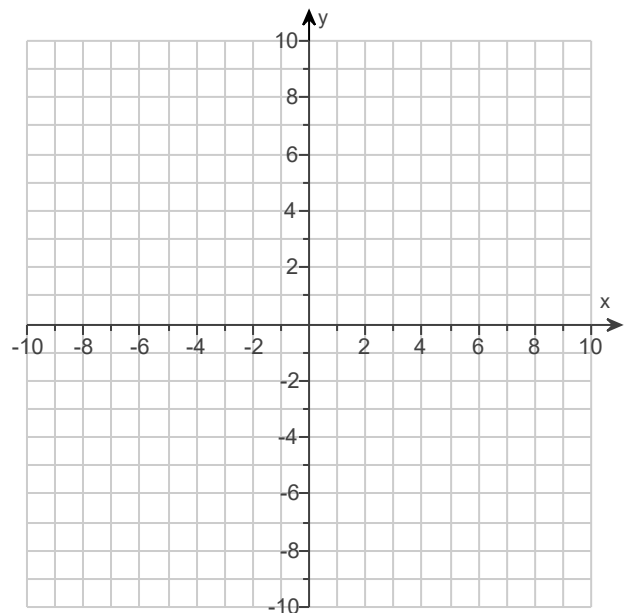
Use the graphing tool to graph the system of inequalities.



69. Graph the solution set of the system.

$$\begin{aligned} -2x - y &\geq 4 \\ y &\geq -4 \\ x &\geq -6 \end{aligned}$$

Use the graphing tool to graph the system of inequalities.



70. Solve this system of equations.

$$\begin{aligned} 4a + 7b &= -1 \\ 8a + 2c &= 32 \\ 6b + 2c &= -26 \end{aligned}$$

Select the correct choice bellow and, if necessary, fill in the answer boxes to complete your choice.

- A. The solution is (_____ , _____ , _____).
(Type an exact answer in simplified form.)
- B. There are infinitely many solutions.
- C. There is no solution.

71. Solve.

$$\begin{aligned}5a + 3b + c &= 25 & (1) \\a - 3b + 2c &= -13 & (2) \\14a - 2b + 3c &= 18 & (3)\end{aligned}$$

The solution is (_____, _____, _____).

72. Solve the system by elimination.

$$\begin{aligned}8a + 8b - c &= 5 \\4a + 6b + c &= -4 \\7a - 8b - 4c &= 15\end{aligned}$$

The solution is (_____, _____, _____).
(Type an exact answer in simplified form.)

73. Solve.

$$\begin{aligned}6x - y + z &= 15 \\2x + 2y - 3z &= 9 \\x - 3y + 2z &= -9\end{aligned}$$

The solution is

(_____, _____, _____).

74. Solve the system by substitution. Check your answer.

$$\begin{cases} a + b - 2c = -4 \\ 4b + c = 8 \\ c = 4 \end{cases}$$

The solution is (_____, _____, _____).
(Type integers or simplified fractions.)

75. Solve the system using any method.

$$\begin{aligned}2x - 5y + 7z &= -7 \\x + 2y + z &= 12 \\3y - z &= 11\end{aligned}$$

The solution is (_____, _____, _____).
(Type an exact answer in simplified form.)

76. Write a matrix to represent the following system.

$$\begin{cases} -3x + 8y = 3 \\ 6x - 8y = 7 \end{cases}$$

Complete the matrix below.

$$\left[\begin{array}{cc|c} \hline \hline \hline \hline \hline \hline \end{array} \right]$$

77. Identify the element a_{31} .

$$A = \begin{bmatrix} 5 & 17 & 1 \\ 3 & 0 & 2 \\ 4 & 9 & 8 \end{bmatrix}$$

Select the correct choice and fill in any answer boxes in your choice below.

A. $a_{31} =$ _____

B. There is no such element in the matrix.

78. Identify the element a_{23} .

$$A = \begin{bmatrix} 6 & 16 & 7 \\ 0 & 5 & 3 \\ 9 & 4 & 2 \end{bmatrix}$$

Select the correct choice and fill in any answer boxes in your choice below.

A. $a_{23} =$ _____

B. There is no such element in the matrix.

79. Identify the element a_{23} .

$$A = \begin{bmatrix} 7 & 12 & 3 \\ 8 & 0 & 1 \\ 5 & 4 & 6 \end{bmatrix}$$

Select the correct choice and fill in any answer boxes in your choice below.

A. $a_{23} =$ _____

B. There is no such element in the matrix.

80. Write a matrix to represent the following system.

$$\begin{cases} -6x + y = 4 \\ 9x - 6y = 3 \end{cases}$$

Complete the matrix below.

$$\left[\begin{array}{cc|c} \hline & & \\ \hline & & \\ \hline \end{array} \right]$$

81. Write a matrix to represent the system of equations.

$$9x - y + 5z = -9$$

$$7x - 5y + 2z = 7$$

$$6y - z = -2$$

The matrix for the system is $\left[\begin{array}{ccc|c} \hline & & & \\ \hline & & & \\ \hline & & & \\ \hline \end{array} \right]$.

82. Write the system of equations represented by the matrix.

$$\left[\begin{array}{ccc|c} 7 & -5 & 5 & 3 \\ 7 & 6 & -7 & 4 \\ -6 & 4 & 4 & 5 \end{array} \right]$$

Choose the correct answer below.

A. $\begin{cases} 7x - 5y + 5z = 3 \\ 7x + 6y - 7z = 4 \\ -6x + 4y + 4z = 5 \end{cases}$

B. $\begin{cases} 7x + 7y - 6z = 3 \\ -5x + 6y + 4z = 4 \\ 5x - 7y + 4z = 5 \end{cases}$

C. $\begin{cases} 7w - 5x + 5y + 3z = 0 \\ 7w + 6x - 7y + 4z = 0 \\ -6w + 4x + 4y + 5z = 0 \end{cases}$

D. $\begin{cases} 7x - 5y = 5/3 \\ 7x + 6y = -7/4 \\ -6x + 4y = 4/5 \end{cases}$

83. Solve the system of equations using a matrix.

$$\begin{cases} x + 3y = 15 \\ 2x - y = 2 \end{cases}$$

The solution to the system is _____.
(Simplify your answer. Type an ordered pair.)

84. Solve the system of equations using a matrix.

$$\begin{cases} x + 3y = 7 \\ 4x - y = 2 \end{cases}$$

The solution to the system is _____.
(Simplify your answer. Type an ordered pair.)

85. Use a graphing calculator to solve the system.

$$4x + y - 3z = -10$$

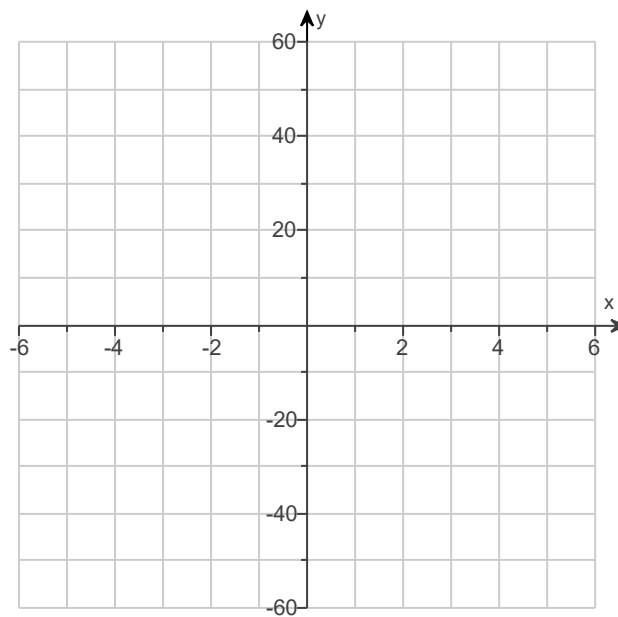
$$5x + 2y + z = -14$$

$$-4x - 4y + 2z = 16$$

The solution for the system is $x =$ _____, $y =$ _____, and $z =$ _____.

86. Graph the function $f(x) = -10x^2$.

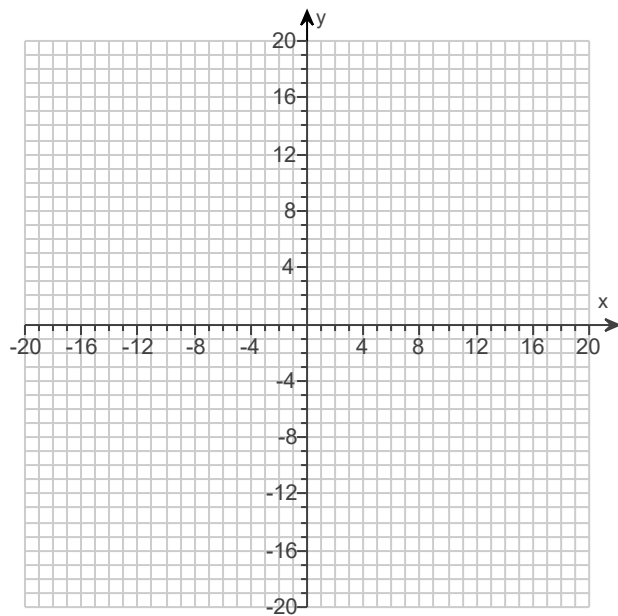
Use the graphing tool on the right to graph the equation.



87. Graph the function.

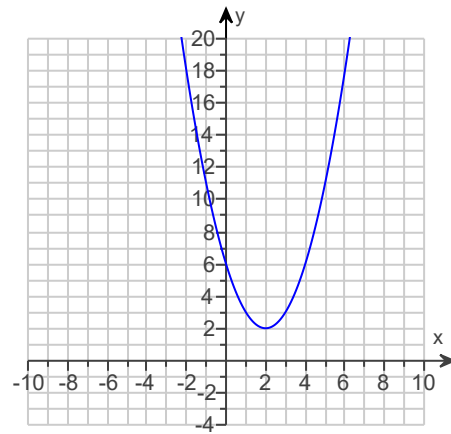
$$y = \frac{1}{9}x^2$$

Use the graphing tool to graph the function.



88. Write a quadratic function to model the graph to the right.

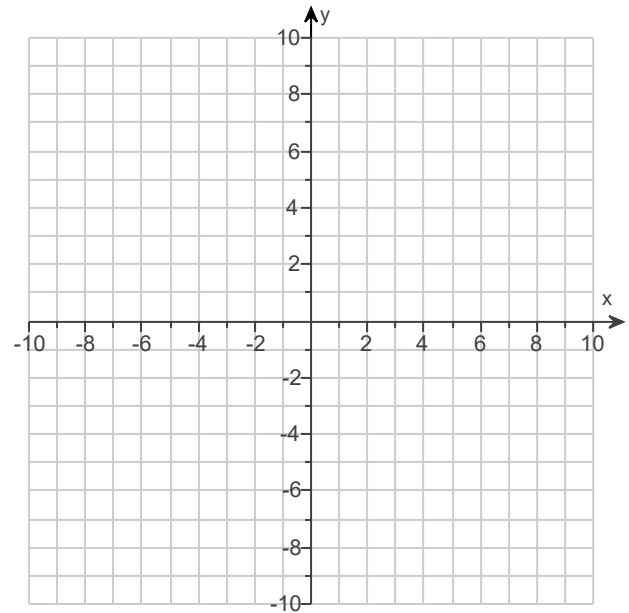
$f(x) =$ _____



89. Sketch the parabola using the given information.

vertex $(0, 2)$, point $(-8, -7)$

Use the graphing tool to graph the parabola.



90. Factor the following expression.

$$x^2 + 4x + 3$$

$$x^2 + 4x + 3 =$$

91. Factor by using the difference of two squares formula.

$$x^2 - 64$$

$$x^2 - 64 =$$

92. Factor the difference of two squares.

$$25x^2 - 9$$

$$25x^2 - 9 =$$

93. Factor the following expression.

$$p^2 - 14p + 49$$

$$p^2 - 14p + 49 = \underline{\hspace{2cm}}$$

94. Factor out the greatest common factor.

$$14x^2 + 10x$$

$$14x^2 + 10x = \underline{\hspace{2cm}}$$

95. Factor the following expression.

$$x^2 + 12x + 35$$

$$x^2 + 12x + 35 = \underline{\hspace{2cm}}$$

96. Factor the following expression.

$$x^2 + 9x + 20$$

$$x^2 + 9x + 20 = \underline{\hspace{2cm}}$$

97. Factor the following expression.

$$x^2 + 17x + 30$$

$$x^2 + 17x + 30 = \underline{\hspace{2cm}}$$

98. Factor the following expression.

$$x^2 - 17x + 52$$

$$x^2 - 17x + 52 = \underline{\hspace{2cm}}$$

99. Factor the following expression.

$$x^2 - 17x + 30$$

$$x^2 - 17x + 30 = \underline{\hspace{2cm}}$$

100. Factor the expression.

$$x^2 - 8x - 20$$

$$x^2 - 8x - 20 = \underline{\hspace{2cm}}$$

101. Factor the following expression.

$$x^2 + x - 6$$

$$x^2 + x - 6 = \underline{\hspace{2cm}}$$

102. Factor out the greatest common factor.

$$15x^2 - 10x$$

$$15x^2 - 10x = \underline{\hspace{2cm}}$$

103. Factor the expression completely.

$$7x^2 - 7x - 14$$

$$7x^2 - 7x - 14 = \underline{\hspace{2cm}}$$

104. Factor the expression.

$$4x^2 + 12x + 5$$

$$4x^2 + 12x + 5 = \underline{\hspace{2cm}}$$

105. Factor the following expression.

$$x^2 - 36$$

$$x^2 - 36 = \underline{\hspace{2cm}}$$

106. Factor completely.

$$6s^2 - 96$$

$$6s^2 - 96 = \underline{\hspace{2cm}}$$

107. Solve the equation by factoring.

$$x^2 - 121 = 0$$

$$x = \underline{\hspace{2cm}}$$

(Use a comma to separate answers as needed.)

108. Solve the equation.

$$n^2 - 14n + 45 = 0$$

$$n = \underline{\hspace{2cm}}$$

(Use a comma to separate answers as needed.)

109. Solve the equation by factoring.

$$t^2 - 14t + 49 = 0$$

$$t = \underline{\hspace{2cm}}$$

(Use a comma to separate answers as needed.)

110. Solve the equation by factoring. Check your answer.

$$x^2 - 13x = 0$$

$$x = \underline{\hspace{2cm}}$$

(Use a comma to separate answers as needed.)

111. Solve the equation by factoring. Check your answer.

$$3x^2 = 18x$$

$$x = \underline{\hspace{2cm}}$$

(Use a comma to separate answers as needed.)

112. Solve the equation by factoring, using tables, or by graphing.

$$(x - 6)^2 = 36$$

$$x = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

113. Solve the equation by finding square roots.

$$5x^2 = 20$$

$$x = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

114. Complete the square.

$$z^2 - 16z$$

Find the missing term that completes the square.

$$z^2 - 16z + \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a fraction.)

115. Solve the following equation by finding square roots.

$$x^2 - 16 = 0$$

$$x = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

116. Solve the equation using the Quadratic Formula.

$$x^2 - 5x - 11 = 0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x = \underline{\hspace{2cm}}$

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

B. There are no real solutions.

117. Find the discriminant of the quadratic equation. Determine the number of real solutions.

$$4x^2 - 12x + 9 = 0$$

What is the discriminant of the quadratic equation?

How many real solutions does the quadratic equation have?

- Two real solutions
 - One real solution
 - No real solutions
-

118. Evaluate the discriminant for the equation. Determine the number of real solutions.

$$5x^2 + 8x + 6 = 0$$

What is the discriminant of the quadratic equation?

How many real solutions does the quadratic equation have?

- Two real solutions
 - No real solutions
 - One real solution
-

119. Evaluate the discriminant for the following equation. Determine the number of real solutions.

$$2x^2 + 20x + 50 = 0$$

The discriminant of the given equation is _____.

The equation has _____ real solution(s).
(Type a whole number.)

120. Evaluate the discriminant for the equation. Determine the number of real solutions.

$$5x^2 - 10x = -5$$

What is the discriminant of the quadratic equation?

How many real solutions does the quadratic equation have?

- Two real solutions
 - One real solution
 - No real solutions
-

121. Simplify the following number by using the imaginary number i .

$$\sqrt{-45}$$

$$\sqrt{-45} = \underline{\hspace{2cm}}$$

(Simplify your answer. Express complex numbers in terms of i . Type an exact answer, using radicals as needed.)

122. Simplify the expression.

$$(8 + i)(7 + 5i)$$

The simplified expression is $\underline{\hspace{2cm}}$.

(Type your answer in the form $a + bi$.)

123. Write the number as a product of a real number and i . Simplify all radical expressions.

$$\sqrt{-10}$$

$$\sqrt{-10} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type your answer in the form $a + bi$. Type an exact answer, using radicals as needed.)

124. Express in terms of i .

$$\sqrt{-64}$$

$$\sqrt{-64} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type your answer in the form $a + bi$.)

125. Simplify the following number by using the imaginary number i .

$$\sqrt{-147}$$

$$\sqrt{-147} = \underline{\hspace{2cm}}$$

(Simplify your answer. Express complex numbers in terms of i . Type an exact answer, using radicals as needed.)

126. Subtract.

$$(8 + 3i) - (7 + 8i)$$

$$(8 + 3i) - (7 + 8i) = \underline{\hspace{2cm}}$$

(Type your answer in the form $a + bi$.)

127. Simplify the expression.

$$(5 + i)(4 - 6i)$$

The simplified expression is $\underline{\hspace{2cm}}$.

(Type your answer in the form $a + bi$.)

128. Divide and simplify to the form $a + bi$.

$$\frac{6 - 5i}{8 + 3i}$$

$$\frac{6 - 5i}{8 + 3i} = \underline{\hspace{2cm}}$$

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type your answer in the form $a + bi$.)

129. Multiply.

$$8i(2 - i)$$

$$8i(2 - i) = \underline{\hspace{2cm}}$$

(Type your answer in the form $a + bi$. Use integers or fractions for any numbers in the expression.)

130. Write the polynomial in standard form. Then classify it by degree and by number of terms.

$$9x^3 - 2 + 6x^2$$

Write the polynomial in standard form. Choose the correct answer below.

- A. $9x^3 + 6x^2 - 2$
 B. $9x^3 - 2 + 6x^2$
 C. $-2 + 9x^3 + 6x^2$
 D. $-2 + 6x^2 + 9x^3$

Classify the polynomial.

The polynomial is a (1) _____ (2) _____.

- (1) cubic (2) trinomial
 constant binomial
 linear monomial
 quadratic polynomial of four terms
-

131. Factor the expression.

$$x^2 - 14x - 32$$

$$x^2 - 14x - 32 = \underline{\hspace{2cm}}$$

(Type your answer in factored form.)

132. Divide using long division. Check your answer.

$$(4x^2 - 10x + 1) \div (x - 3)$$

The quotient is _____ with remainder _____.

133. Divide using long division. Check your answer.

$$(x^3 + 3x^2 + x - 8) \div (x - 1)$$

The quotient is _____ with a remainder of _____.
(Simplify your answers. Do not factor.)

134. Divide using synthetic division.

$$\frac{2x^3 + 8x^2 - 9x + 4}{x - 2}$$

$$\frac{2x^3 + 8x^2 - 9x + 4}{x - 2} = \text{_____}, \text{ remainder } \text{_____}$$

135. Divide.

$$(x^5 - 1) \div (x - 1)$$

The quotient is _____ with a remainder of _____.
(Simplify your answers. Use integers or fractions for any numbers in the expression. Do not factor.)

136. Divide using synthetic division.

$$(x^4 - 6x^2 - 31) \div (x + 2)$$

The quotient is _____ and the remainder is _____.
(Simplify your answers. Do not factor.)

137. Find the square roots of 9.

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A.** The square roots of 9 are _____. (Use a comma to separate answers as needed.)
- B.** The square roots are not real numbers.
-

138. Find all the cube roots of -1000 .

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A.** The real cube root(s) of -1000 is/are _____.
(Simplify your answer. Use a comma to separate answers as needed.)
- B.** There are no real cube roots of -1000 .
-

139. Find the real root.

$$\sqrt[3]{-512}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $\sqrt[3]{-512} =$ _____
(Type an integer or a decimal. Use a comma to separate answers as needed.)
- B. There is no real root.
-

140. Find the two real solutions of the following equation.

$$x^2 = 144$$

x = _____
(Simplify your answer. Use a comma to separate answers as needed.)

141. Multiply.

$$\sqrt{5} \cdot \sqrt{2}$$

$\sqrt{5} \cdot \sqrt{2} =$ _____ (Type an exact answer, using radicals as needed.)

142. Divide and simplify.

$$\frac{\sqrt[7]{14x^6}}{\sqrt[7]{2x^5}}$$

$\frac{\sqrt[7]{14x^6}}{\sqrt[7]{2x^5}} =$ _____
(Simplify your answer. Type an exact answer, using radicals as needed.)

143. Simplify the product.

$$\sqrt{3} \cdot \sqrt{12}$$

$\sqrt{3} \cdot \sqrt{12} =$ _____ (Type an exact answer, using radicals as needed.)

144. Multiply if possible. Then simplify.

$$\sqrt[3]{16} \cdot \sqrt[3]{4}$$

$\sqrt[3]{16} \cdot \sqrt[3]{4} =$ _____

145. Divide and simplify.

$$\frac{\sqrt[3]{256}}{\sqrt[3]{4}}$$

$$\frac{\sqrt[3]{256}}{\sqrt[3]{4}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

146. Rationalize the denominator of the following expression.

$$\frac{\sqrt[4]{2}}{\sqrt[4]{5}}$$

$$\frac{\sqrt[4]{2}}{\sqrt[4]{5}} = \underline{\hspace{2cm}}$$
 (Simplify your answer. Type an exact answer, using radicals as needed.)

147. Simplify the following expression.

$$\sqrt{3} \cdot \sqrt{30}$$

$$\sqrt{3} \cdot \sqrt{30} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

148. Simplify the following expression.

$$\sqrt{x^7 y^7} \cdot 3\sqrt{5x^3 y^6}$$

$$\sqrt{x^7 y^7} \cdot 3\sqrt{5x^3 y^6} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

149. Simplify by combining like radicals.

$$3\sqrt{3} + 6\sqrt{3}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $3\sqrt{3} + 6\sqrt{3} = \underline{\hspace{2cm}}$
(Type an exact answer, using radicals as needed.)

B. The expression cannot be simplified.

150. Multiply.

$$(8 - \sqrt{6})(8 + \sqrt{6})$$

The answer is .