

1. Determine whether the relation is a function.
 Give its domain and range.

x	y
3	-6
3	-1
3	2
3	3

Is the relation represented in the table a function? Yes No

The domain is { _____ }.
 (Use a comma to separate answers as needed.)

The range is { _____ }.
 (Use a comma to separate answers as needed.)

2. Find an equation of the line that satisfies the given conditions.

Through $(-0.4, 0.4)$; vertical

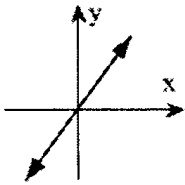
The equation of the line that satisfies the given conditions is _____.
 (Write an equation. Use integers or decimals for any numbers in the equation.)

3. Match the equation with its graph (a. – f.), where m is a constant.

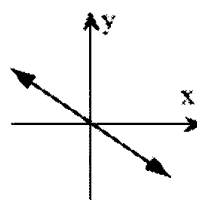
$$y = mx, m > 0$$

Choose the graph that matches the equation.

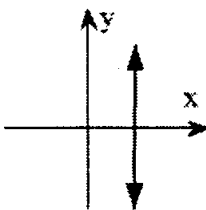
a.



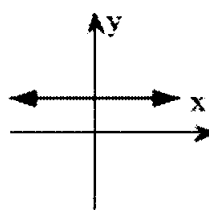
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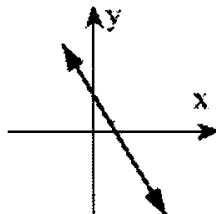
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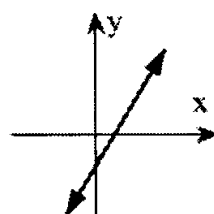
d.



e.



f.



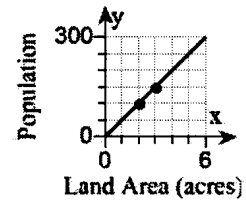
4. Use the table below to evaluate the given expressions.

x	$f(x)$
-4	-1
-2	4
0	13
2	-4
4	27

Part 1. $f(-4) =$ _____

Part 2. $f(4) =$ _____

5. The graph to the right illustrates the average number of people living on parcels of land of various sizes in 1960. Complete parts (1) through (4).



Part 1. The graph passes through the points (2, 100) and (3, 150). Discuss the meaning of these points. Choose the correct answer below.

- a. Two acres have 100 people and 3 acres have 150 people, on average.
- b. One hundred acres have exactly 2 people and 150 acres have exactly 3 people.
- c. One hundred acres have 2 people and 150 acres have 3 people, on average.
- d. Two acres have exactly 100 people and 3 acres have exactly 150 people.

Part 2. Find the slope-intercept form of the line.

Part 3. Interpret the slope as a rate of change.

Choose the correct answer below.

- a. The land has exactly this many people per acre.
- b. The land has this many people per acre, on average.
- c. There are this many acres per person, on average.
- d. There are exactly this many acres per person.

Part 4. Write the equation of this line as a linear function P that outputs the average number of people living on x acres of land.

6. Find the slope-intercept form of the equation of the line with the following:

x-intercept value: -6

y-intercept value: 7

What is the slope-intercept form of the line? $y =$ _____

(Use integers or simplified fractions for any numbers in the equation.)

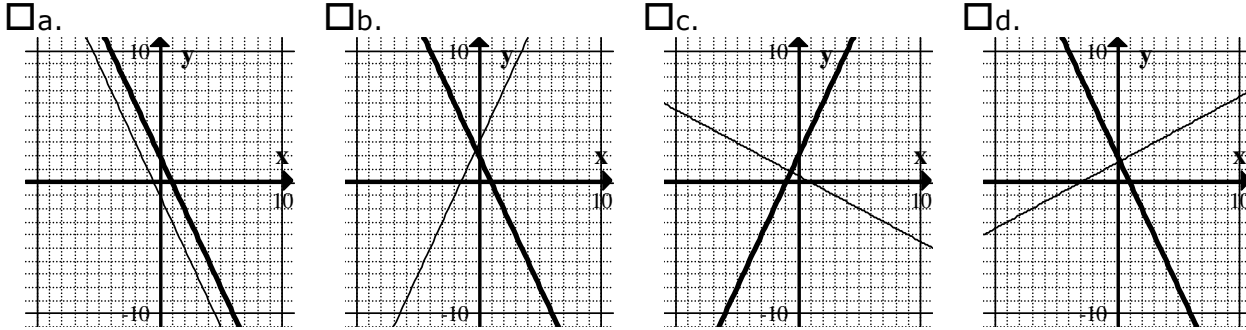
7. Do the following. (1) Find the slope-intercept form of the line perpendicular to the given line, passing through the given point. (2) Graph the two lines.

$$y = -2x + 2, (-1, 1)$$

part 1: What is the slope-intercept form of the line?

(Use integers or simplified fractions for any numbers in the equation.)

part 2: Choose the graph below that shows $y = -2x + 2$ in bold and also the perpendicular line.

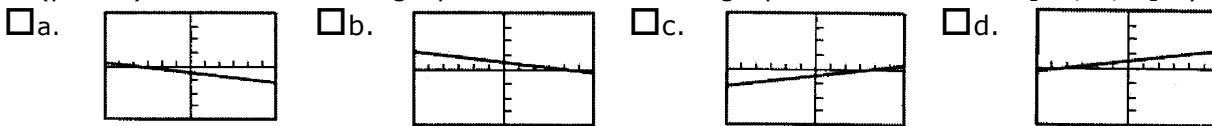


8. Let $f(x) = \frac{x+4}{8}$.

(part 1) Make a numerical representation of f for $x = -3, -2, -1, \dots, 3$ by completing the table below. (Use integers or simplified fractions.)

x	-3	-2	-1	0	1	2	3
f(x)							

(part 2) Choose the graph below that is the graph f in the window $[-6, 6, 1]$ by $[-4, 4, 1]$.



9. Write an equation of the line containing the given point and parallel to the given line. Express your answer in the form $y = mx + b$.

$$(8, 9); 6x + y = 8$$

The equation of the line is $y = \underline{\hspace{2cm}}$.

(Use integers or simplified fractions for any numbers in the equation.)

10. Find the equation of the line that fits the description.

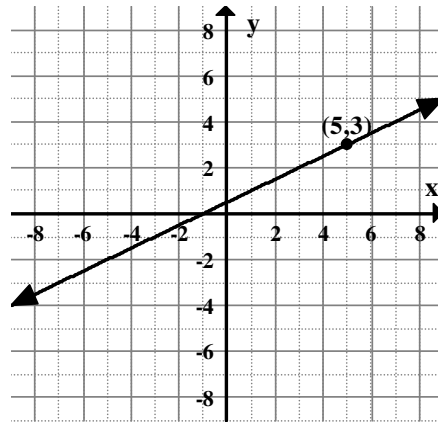
Passes through $(-7, -5)$ and has zero slope.

The equation of the line is _____. (Simplify your answer.)

11. Use the labeled point and the slope to find the slope-intercept form of the line.

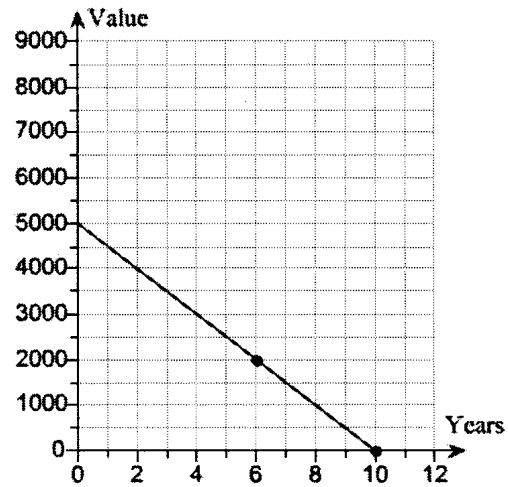
What is the slope-intercept form of the line?

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



12. The graph shows data regarding the value of a certain computer over time.

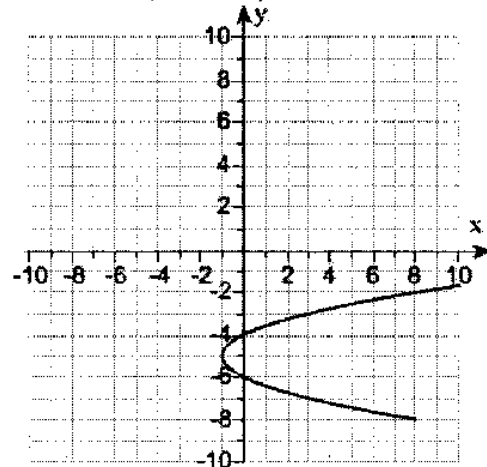
The computer's value decreases at a rate of \$ _____ per year.



13. Determine whether the graph represents a function. If it does, identify the domain and range.

Choose the correct description of the graph.

- a. The graph is not a function.
- b. The graph is a function whose domain is $x \geq -1$ and whose range is all real numbers.
- c. The graph is a function whose domain is all real numbers and whose range is $y \geq -5$.
- d. The graph is a function whose domain is all real numbers and whose range is all real numbers.



14. Use the table below to determine whether $f(x)$ could represent a linear function. If it could, write $f(x)$ in the form $f(x) = ax + b$.

x	0	1	2	3
$f(x)$	-6	-2	2	6

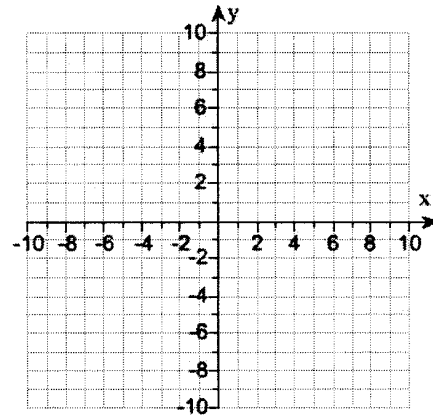
Part 1: Could $f(x)$ represent a linear function? Yes No

Part 2: If $f(x)$ is linear, write $f(x)$ in the form $f(x) = ax + b$, using integers or fractions for any numbers. If $f(x)$ is not linear, write N on the answer sheet.

15. For the points $(-4, 2)$ and $(4, -3)$, do the following.

Part 1: Find the slope of the line passing through the given points. Simplify your answer. Use an integer or a fraction.

Part 2: Plot these points and graph the line.



16. Write an equation in standard form of the line satisfying the following condition.

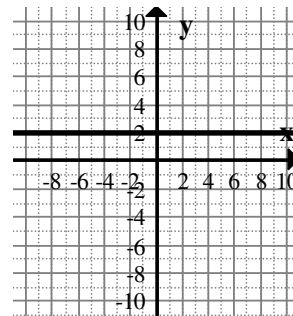
The line goes through $(2, 1)$, and is horizontal.

Choose the correct equation for the line.

- a. $y + 1 = 2$ b. $x = 2$ c. $y = 1$ d. $x + y = 3$

17. Find the slope of the line in the figure. If the slope of the line is undefined, so state.

The slope of the line is _____.
 (Use an integer or a simplified fraction. Use N if the slope is undefined.)



18. Find the domain of the following function.

$$f(x) = \frac{2}{x + 8}$$

Choose the correct domain below.

- a. $x > -8$
 b. $x < -8$
 c. $x \neq -8$
 d. all real numbers

-
19. Determine whether the relation is a function. Identify the domain and the range.

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

Part 1: Is the relation a function? Yes No

Part 2: The domain is { _____ }. (Use a comma to separate answers as needed.)

Part 3: The range is { _____ }. (Use a comma to separate answers as needed.)

-
20. Find $f(x) = mx + b$ so that f models the data, where x is the number of years since 2000. Then use $f(x)$ to make the requested estimate.

In 2005 the average adult ate 58 pounds of chicken and in 2010 this amount will increase to 62 pounds. Estimate chicken consumption in 2008.

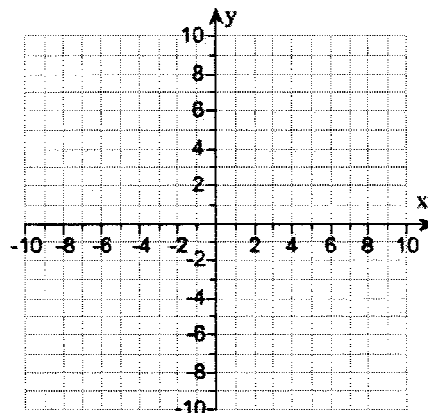
What is the model $f(x) = mx + b$?

$f(x) =$ _____
(Use integers or decimals for any numbers in the expression.)

The estimate for chicken consumption in 2008 is _____ pounds.
(Use an integer or a decimal.)

-
21. Graph the following inequality.

$$y \geq 5$$



-
22. Factor the trinomial completely. (Write P if the expression is prime.)

$$18m^3 - 24m^2 + 8m = \underline{\hspace{10em}}$$

23. Use the FOIL method to find the product.

$$(7s - u)(7s + 5u)$$

The product is _____.
(Simplify your answer.)

24. Let x represent the number. Use the given conditions to write an equation. Solve the equation and find the number.

The product of 9 and a number is 126. Find the number.

Part 1: An equation for the given conditions is _____.

Part 2: The number is $x =$ _____.

25. Solve the equation.

$$3b^2 - 21b = 0$$

The solution set is { _____ }.
(Use an integer or a fraction. Use a comma to separate answers as needed.)

26. Solve the system.

$$\begin{aligned} 5x + 6y &= 3 \\ 10x + 12y &= 6 \end{aligned}$$

What is the solution of the system?

- a. $\{(x, y) \mid 5x + 6y = 3\}$
 b. a point
 c. no solution
-

27. Solve the inequality. Write your answer using set builder notation.

$$3 - 5x \geq -\frac{2}{5}$$

The solution set is $\{x \mid \text{_____}\}$.
(Simplify your answer. Use an inequality. Use integers or fractions for any numbers in the expression.)

28. Perform the subtraction. (Simplify your answer.)

$$(3x^3 - 2x^2 + 4) - (-8x^3 + 6x - 3) = \underline{\hspace{10em}}$$

29. A mother wants to invest \$13000 for her children's education. She invests a portion of the money in a bank certificate of deposit (CD account) which earns 4% and the remainder in a savings bond that earns 7%. If the total interest earned after one year is \$780, how much money was invested at each rate?

Part1: How much money was invested in the CD account?

\$_____ (Round to the nearest cent.)

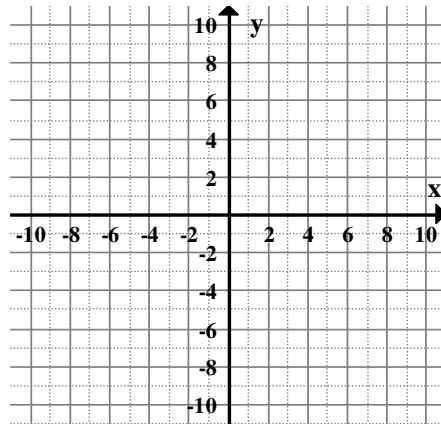
Part2: How much money was invested in savings bonds?

\$_____ (Round to the nearest cent.)

30. Find the slope of the line, and sketch the graph.

$$x + 4 = 0$$

The slope is _____ .
(Write N if the slope is undefined.)



31. Solve the equation for p.

$$\frac{r + p}{6} = 3$$

p = _____. (Simplify your answer.)

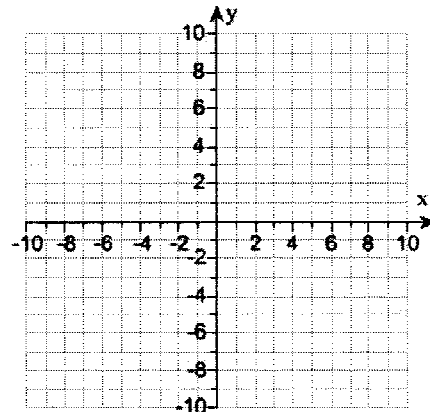
32. Solve the system by graphing. Graph each equation using the coordinate grid on the right.

$$y = x + 8$$

$$y = -x - 2$$

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

- a. The solution is _____.
(Write an ordered pair.)
- b. There are infinitely many solutions.
- c. There is no solution.



33. Solve the three part inequality. Write the answer in interval notation.

$$7 < x + 8 < 9$$

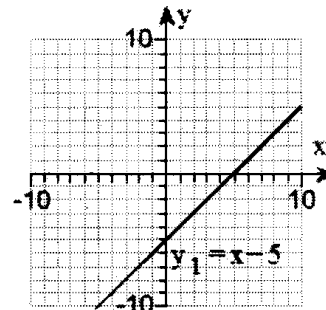
What is the solution? Give your answer in interval notation, or write N if there is no solution.

34. Use the graph of $y_1 = x - 5$ to solve each equation or inequality.

Part 1. $y_1 = 0$

Part 2. $y_1 < 0$

Part 3. $y_1 > 0$



Part 1. The solution set is $\{x \mid \underline{\hspace{2cm}}\}$.
(Simplify your answer. Write an equation.)

Part 2. The solution set is $\{x \mid \underline{\hspace{2cm}}\}$.
(Simplify your answer. Write an inequality.)

Part 3. The solution set is $\{x \mid \underline{\hspace{2cm}}\}$.
(Simplify your answer. Write an inequality.)

35. Write the expression in radical notation.

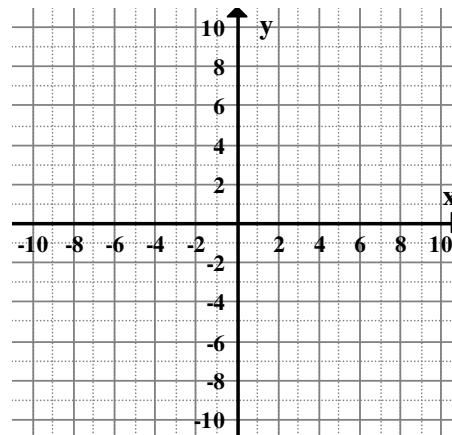
$$(8x)^{1/5} = \underline{\hspace{2cm}}$$

(Give an exact answer, using radicals as needed.)

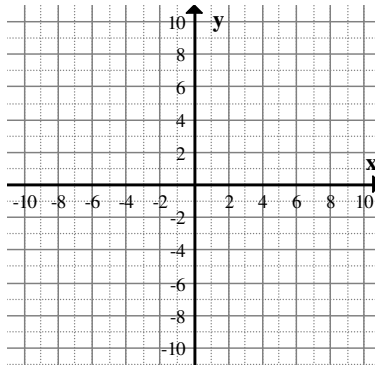
36. Find the slope of the line, and sketch the graph.

$$5x - 3y = 15$$

The slope is $\underline{\hspace{2cm}}$.
(Use an integer or a simplified fraction. Use N if the slope is undefined.)



37. Suppose white chocolate costs \$4 per pound and milk chocolate costs \$5 per pound. Let x be the number of pounds of white chocolate and y be the number of pounds of milk chocolate bought. Graph the region in the xy -plane that represents all possible weight combinations of white and milk chocolate that can be bought for \$20 or less.



38. Write an equation in standard form of the line satisfying the following condition.

The line goes through $(-2, 4)$, and is perpendicular to $x = 6$. Choose the correct equation for the line.

- a. $y + 4 = 2$ b. $x + y = 2$ c. $y = 4$ d. $x = -2$

39. Factor.

$$64b^2 - 49 = \underline{\hspace{2cm}}.$$

(Use N if the binomial is not factorable.)

40. Solve the equation.

$$-c^2 = 25 - 10c$$

The solution set is $\{ \underline{\hspace{2cm}} \}$.

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

41. Simplify. Assume all variables represent positive real numbers.

$$\sqrt[3]{-343x^6} = \underline{\hspace{2cm}}$$

(Give an exact answer, using radicals as needed.)

42. Evaluate the expression.

$$16^{3/2} = \underline{\hspace{2cm}}$$

(Give an exact answer, using radicals as needed.)

43. Solve the equation

$$3x^2 - 15 = 0$$

The solution set is { _____ }.

(Give an exact answer, using radicals as needed. Rationalize all denominators. Use a comma to separate answers as needed. Simplify your answer.)

44. Solve the equation. Write N if there is no solution.

$$\sqrt{x + 73} = x + 1$$

45. Multiply.

$$(6\sqrt{7} + 6\sqrt{5})(2\sqrt{7} - \sqrt{5}) = \underline{\hspace{4cm}}$$

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

46. Write the following using radical notation, using positive exponents only if needed. Assume that all variables represent positive real numbers.

$$(5m^5 + 5k^4)^{-4/5}$$

How would you write with radicals?

a. $\frac{1}{(\sqrt[5]{5m^5 + 5k^4})^4}$

b. $\frac{1}{\sqrt[4]{(5m^5 + 5k^4)^5}}$

c. $-\sqrt[5]{(5m^5 + 5k^4)^4}$

d. $\frac{1}{\sqrt[5]{5m^5 + 5k^4}}$

47. Find the minimum y-value on the graph of $y = f(x)$. Then state where the graph of f is increasing and where it is decreasing using inequality notation.

$$f(x) = x^2 + 6x + 3$$

Part 1: The minimum y-value is $y = \underline{\hspace{2cm}}$.

Part 2: The graph of f is increasing when $x \underline{\hspace{2cm}}$.

Part 3: The graph of f is decreasing when $x \underline{\hspace{2cm}}$.

48. Express the radical in simplified form. Assume that all variables represent positive real numbers.

$$\sqrt[3]{\frac{32x^{10}}{27}}$$

Choose the simplified form of the expression.

a. $\frac{x^3 \sqrt[3]{32x}}{3}$

b. $\frac{2x^3 \sqrt[3]{4x}}{27}$

c. $\frac{2x^3 \sqrt[3]{4x}}{3}$

d. $\frac{2 \sqrt[3]{4x^{10}}}{3}$

49. Solve the equation. If there is no solution, write N on the answer sheet.

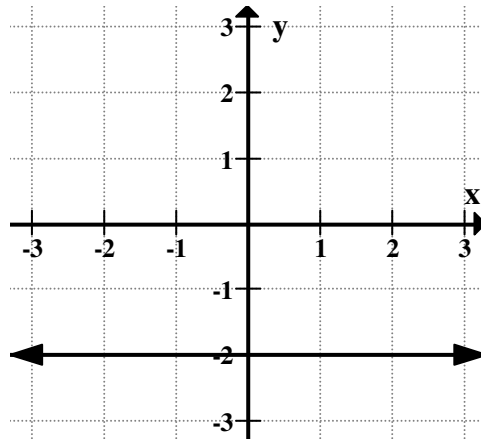
$$\frac{-3}{3x} + \frac{24}{15x} = \frac{3}{15}$$

50. Use the graph of f to evaluate the expressions below.

$f(-2)$ and $f(-1)$

$f(-2) =$ _____

$f(-1) =$ _____



51. Simplify.

$$\frac{5z}{2-z} - \frac{6z-2}{2-z} =$$

(Simplify your answer.)

52. Complete the equation. (Simplify your answer. Use an integer.)

$$\sqrt{28} = \text{_____} \sqrt{7}$$

53. Divide and simplify.

$$\frac{2a^4b^2}{121a^2b} \div \frac{4a^2b}{66a^4b^3} = \underline{\hspace{2cm}}$$

54. Solve the formula for the given letter.

$$F = \frac{kH}{r^2}, \text{ for } r.$$

Choose the correct formula.

a. $r = \pm \frac{2F}{kH}$

b. $r = \frac{kH}{F}$

c. $r = \pm \sqrt{\frac{kH}{F}}$

d. Not Given

55. Projectile Height. A rocket is fired upward from some initial distance above the ground. Its height in feet, h , above the ground, s seconds after it is fired, is given by

$$h = -16s^2 + 128s + 768.$$

Find its maximum height, when the rocket is fired and when it reaches the ground.

Part 1: What is the maximum height (in ft.)? _____

Part 2: How long does it take for the rocket to reach its maximum height?

$s =$ _____ sec.

Part 3: After it is fired, the rocket reaches the ground at $s =$ _____ sec.

56. Rewrite using radical notation. Then simplify.

Part 1: $(-125)^{1/3}$ written in radical notation is _____ .
(Use an exact answer, using radicals as needed.)

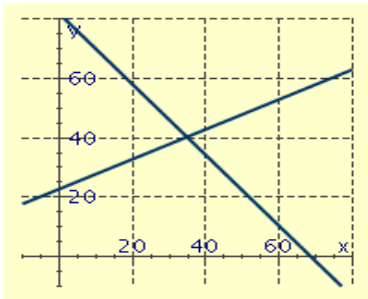
Part 2: Simplify $(-125)^{1/3}$. Write N on the answer sheet if the answer is not real.

57. Express in terms of i . Simplify your answer.

$$\sqrt{-75} = \underline{\hspace{2cm}}$$

58. Membership in the County Museum has been increasing slowly since it was built in 1960. The number of members is given by the function $M(t) = 200 + 15t^{1/2}$, where t is the number of years since 1960. How many members were there in the year 2000? Round to the nearest whole person.

59. Solve the system of equations using the graph given. Give your best estimate.



60. Use any method to solve the equation.

$$5x^2 - 3x - 7 = 0$$

The solution set is { _____ }.

(Use a comma to separate answers as needed. Give an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use N if there are no real solutions.)

61. Evaluate the function below at the indicated values.

$$s(t) = \sqrt{t + 7}$$

a. Find $s(-7)$. $s(-7) =$ _____

b. Find $s(2)$. $s(2) =$ _____

c. Determine the domain of the function. Write using inequality notation: _____

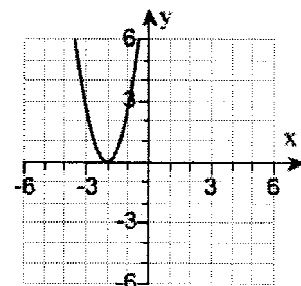
62. A graph of $y = ax^2 + bx + c$ is shown to the right.

Part1: Is the value of a positive or negative?

Part2: What are the solutions, if any, to $ax^2 + bx + c = 0$?

$x =$ _____

Simplify your answer. Write an exact answer, using radicals as needed. Use a comma to separate answers as needed. Or write N if there is no real solution.



Part 3: Is the discriminant positive, negative, or zero?

63. For the following equation, state the value of the discriminant and then describe the nature of the solutions.

$$-14x^2 + 9x - 17 = 0$$

Part 1: What is the value of the discriminant? _____

Part 2: Which one of the statements below is correct?

- a. The equation has one real solution.
 b. The equation has two real solutions.
 c. The equation has two imaginary solutions.
-

64. Use the square root property to solve the equation. Give an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Write N if there is no solution

$$(x - 7)^2 = 64$$

65. Use the quadratic formula to find any x-intercepts on the graph of the equation.

$$y = x^2 - 2x + 9$$

Write all x-intercepts below.

(Simplify your answer. Give an exact answer, using radicals as needed. Use a comma to separate answers as needed. Use N if there is no x-intercept.)

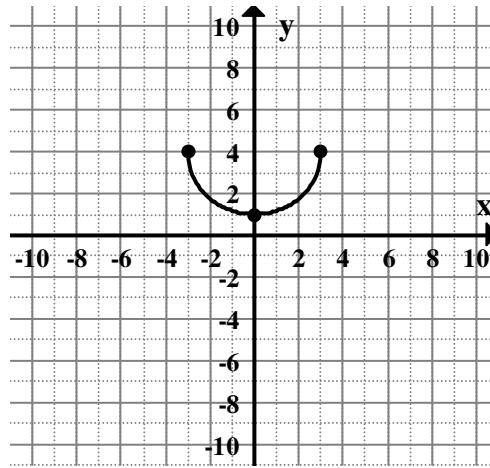
66. Solve the equation.

$$x^2 - 21 = 0$$

What are all the solutions of x? Choose the correct answer below.

- | | |
|--|---|
| <input type="checkbox"/> a. $\sqrt{21}$ and $-\sqrt{21}$ | <input type="checkbox"/> e. $-i\sqrt{21}$ |
| <input type="checkbox"/> b. $i\sqrt{21}$ and $-\sqrt{21}$ | <input type="checkbox"/> f. $\sqrt{21}$ |
| <input type="checkbox"/> c. $i\sqrt{21}$ and $-i\sqrt{21}$ | <input type="checkbox"/> g. $\sqrt{21}$ and $-i\sqrt{21}$ |
| <input type="checkbox"/> d. $-\sqrt{21}$ | <input type="checkbox"/> h. $i\sqrt{21}$ |

67. Use the graph to determine the domain and range of the function.



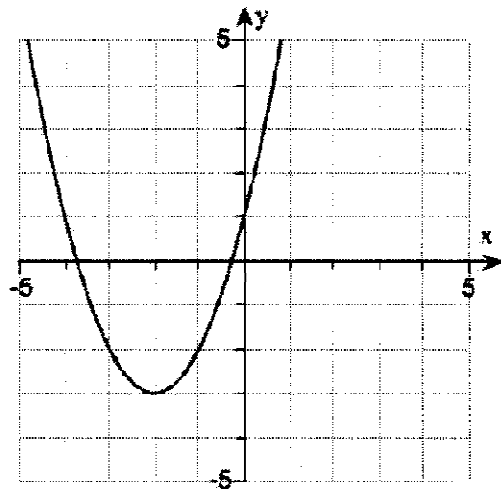
What is the domain of the function?

D: _____ (Use an inequality.)

What is the range of the function?

R: _____ (Use an inequality.)

68. Tell whether the graph is linear, quadratic, or Neither. If it is quadratic, identify the vertex, the axis of symmetry, and whether it opens upward or downward.



Part 1: Is the graph linear, quadratic, or neither?

- a. Neither
 b. Linear
 c. Quadratic

Part 2: The coordinates of the vertex are _____
 (Write an ordered pair.)

Part 3: The axis of symmetry is $x =$ _____.

Part 4: Does the graph open upward or downward?

- Upward
 Downward

69. Perform the indicated operation. Reduce to lowest terms.

$$\frac{6w}{w^2 - 9} + \frac{w}{w - 3}$$

Determine the sum.

70. Without actually solving the equation, list all possible numbers that would have to be rejected if they appeared as proposed solutions.

$$\frac{3x+1}{x-4} = \frac{15x+2}{5x-2}$$

The numbers that would be rejected are _____.

(Use an integer or a fraction. Use a comma to separate answers as needed. Use N if there are no solutions that must be rejected.)

71. Solve the equation.

$$5w^2 - 26w = 24$$

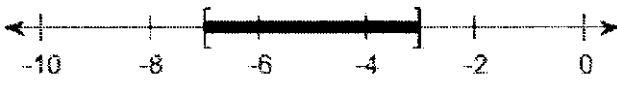


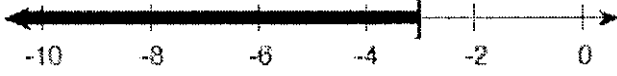
The solution set is { _____ }.

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

72. Graph and write interval notation.

$$-7 \leq x \leq -3$$

Choose the correct graph of the solution set.

- a. 
- b. 
- c. 
- d. 

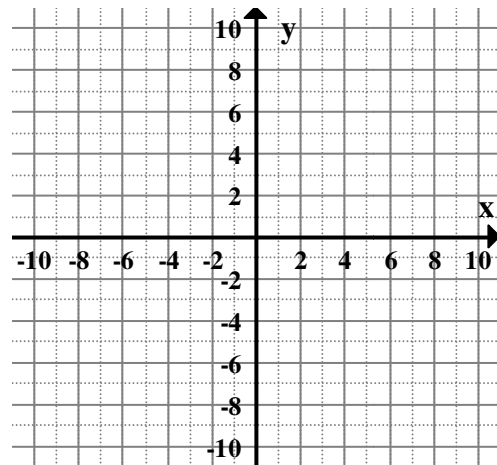
What is the solution set? _____

(Write your answer in interval notation.)

73. Graph the system of inequalities.

$$x \geq 9 + 3y$$

$$y \leq 9 - 3x$$



74. According to recent statistics, the number of pay telephones in a certain state is expected to decrease to 194,000 over the next ten years. This represents a decrease of 17.9% from the number of pay telephones in the state at the current time. Find the number of pay telephones in the state currently.
-

75. Ina Crespo rowed 7.5 miles down the Habashabee River in 1.5 hours, but the return trip took her 2.5 hours. Find the rate Ina rows in still water and the rate of the current.

Ina could row _____ mph in still water.

The current flows _____ mph.

76. A truck enters a highway driving 60 mph. A car enters the highway at the same place 7 minutes later and drives 71 mph in the same direction. From the time the car enters the highway, how long will it take the car to pass the truck?

The care will pass the truck in _____ minutes.
(Round to the nearest minute)

77. Write the rational expression in lowest terms.

$$\frac{(t + 2)(t + 4)}{(t + 5)(t - 2)} \cdot \frac{(t + 5)(t + 8)}{(t + 2)(t + 4)}$$

In lowest terms, the rational expression is _____ .

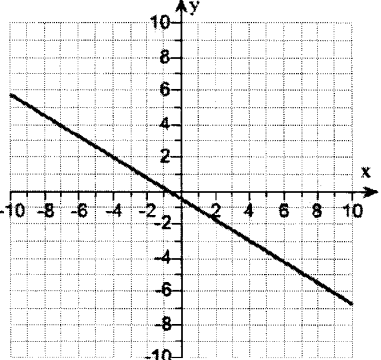
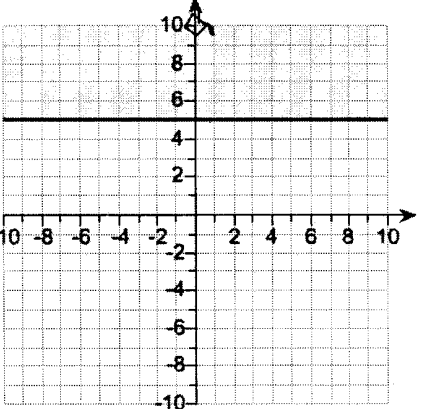
78. Solve. Check your result.

$$\frac{x}{x - 1} = \frac{5}{4}$$

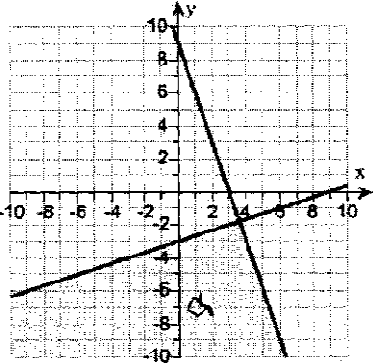
Select the correct choice and, if necessary, fill in the answer blank to complete your choice.

- a. $x =$ _____ (Use a comma to separate answers as needed.)
b. There is no solution.
-

MAT 1033
FINAL REVIEW PACKET
Short Answer Key

1. NO 3 -6, -1, 2, 3		2. $x = -0.4$			3. a			4. -1 27		
5. A $Y = 50x$ B $P(x) = 50x$		6. $y = \frac{7}{6}x + 7$			7. $y = \frac{1}{2}x + \frac{3}{2}$ D			9. $y = -6x + 57$		
8. D	x	-3	-2	-1	0	1	2	3	10. $Y = -5$	11. $y = \frac{1}{2}x + \frac{1}{2}$
	F(x)	1/8	1/4	3/8	1/2	5/8	3/4	7/8		
12. 500		13. A			14. YES $f(x) = 4x - 6$			16. C		
15. $-\frac{5}{8}$					21.					
17. 0		19. YES			20. $f(x) = \frac{4}{5}x + 54$ In 2008, the chicken consumption was 60.4 pounds.			22. $2m(3m - 2)^2$		
18. C		$\{-4, 5, 4, 6, -3\}$ $\{2\}$						23. $49s^2 + 28su - 5u^2$		

24. $9x = 126$ 14	25. 0, 7 26. A	27. $x \leq \frac{17}{25}$	28. $11x^3 - 2x^2 - 6x + 7$
29. 4333.33 8666.67	33. (-1, 1) 35. $\sqrt[5]{8x}$	34. $x = 5$ $x < 5$ $x > 5$	37.
31. $p = 18 - r$			
30. N 	32. Solution is (-5, 3) 	36. 5/3 	
38. C	39. $(8b + 7)(8b - 7)$	40. 5	41. $-7x^2$
42. $\frac{\sqrt{16^3}}{64}$	43. $-\sqrt{5}, \sqrt{5}$ or $\pm\sqrt{5}$	44. $x = 8$	45. $54 + 6\sqrt{35}$
46. A	47. a) -6	50. -2	52. 2
48. C	b) $x \geq -3$	-2	53. $\frac{3a^4b^3}{11}$
49. $x = 3$	c) $x \leq -3$	51. 1	
54. C	55. 1024	57. $5i\sqrt{3}$	60. $\frac{3 \pm \sqrt{149}}{10}$
56. $\sqrt[3]{-125}$ -5	4 12	58. 295 members 59. (35, 40)	

61. a. 0 b. 3 c. $t \geq -7$	62. Part 1: a is positive Part 2: $x = -2$ Part 3: zero	63. Part 1: -871 Part 2: C	65. N
67. $-3 \leq x \leq 3$ $1 \leq y \leq 4$	68. C (-2, -3) $x = -2$ upward	64. $x = 15, -1$	66. A
69. $\frac{w^2 + 9w}{w^2 - 9}$ or $\frac{w(w + 9)}{(w - 3)(w + 3)}$	74. 236,297	70. $4, \frac{2}{5}$	72. A $[-7, -3]$
73. 	77. $\frac{t + 8}{t - 2}$	71. $-\frac{4}{5}, 6$	76. 38
		75. 4 1	78. $x = 5$