Practice Exam 1

Name: Aris Winger

#1 Points possible: 10. Total attempts: 0

Find the slope of the line that goes through the points (-2,7) and (15,-6).

Slope, m = _____

Enter your answer as an integer or a reduced fraction in the form A/B

Answer: $\frac{-6-(7)}{15-(-2)} = -\frac{13}{17}$ which reduces to $-\frac{13}{17}$ (if it's not already reduced)

#2 Points possible: 10. Total attempts: 0

Simplify the expression completely:

$(5x^{10})^4 \cdot x^{-13} =$ _____

Answer: $625 \cdot x^{27}$

#3 Points possible: 10. Total attempts: 0

Solve the system by the substitution method. If there is exactly one solution, write as an ordered pair.

$$\begin{cases} 4x + 3y = -17 \\ -5x + y = -12 \end{cases}$$

- (•) One solution: _____
- ( ) No solution
- ( ) Infinite number of solutions

Answer: $(1, -7)$

#4 Points possible: 10. Total attempts: 0

Mr. Smith and Mr. Stein were driving to a business meeting 250 miles from their office. Mr. Smith drove the first w miles, then Mr. Stein drove the rest of the way.

Write an algebraic expression for how many miles Mr. Stein drove.

_____

Answer: $250 - w$

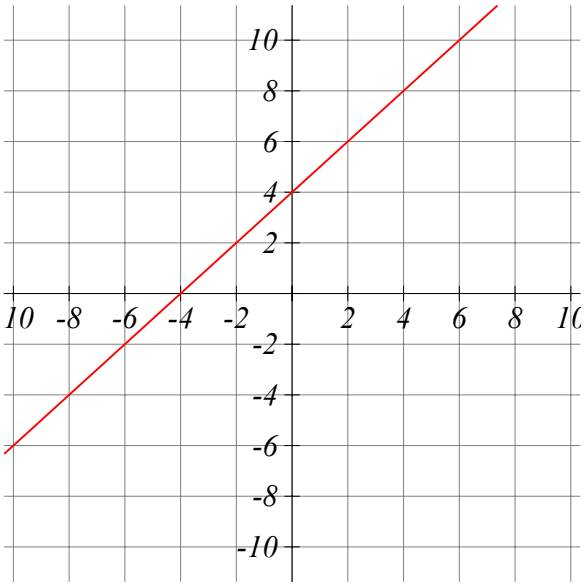
#5 Points possible: 10. Total attempts: 0

Add the 2 polynomials:
$(-7x^4 + 4x^3 + 8x) + (6x^4 - 6x^3 - 10)$

_____

Answer: $-x^4 - 2x^3 + 8x - 10$

#6 Points possible: 10. Total attempts: 0



Write an equation for the graph, where y depends on x.

Answer: $y = 1 \cdot x + 4$

#7 Points possible: 10. Total attempts: 0

Definition of a Function

Which of the following sets of data represent valid functions?

- ☐ $G = \{(0, -1), (3, 2), (3, 6), (7, 8), (11, 16)\}$
- ☐ $R = \{(0, -4), (3, 2), (5, 4), (7, 9), (12, 10)\}$
- ☐ $F = \{(-4, -3), (2, 1), (4, 5), (8, 7), (16, 12)\}$
- ☐ $S = \{(-1, -2), (3, 2), (6, 5), (-1, -2), (16, 12)\}$

Answer:
$R = \{(0, -4), (3, 2), (5, 4), (7, 9), (12, 10)\}$
$S = \{(-1, -2), (3, 2), (6, 5), (-1, -2), (16, 12)\}$
$F = \{(-4, -3), (2, 1), (4, 5), (8, 7), (16, 12)\}$

#8 Points possible: 10. Total attempts: 0

Subtract the polynomials and simplify the result completely:

$$\left(x^3 + 4x^2 - x + 9\right) - \left(-4x^5 + 7x^3 - x^2 - 3\right)$$

Answer: $4x^5 - 6x^3 + 5x^2 - x + 12$

#9 Points possible: 10. Total attempts: 0

Savings

Suppose you were given $900 from your uncle. You deposited that money in a bank and added $10 per month. Use this information to complete the table below.

Number of Months	0	1	2	3	4
Amount Saved	_____	_____	_____	_____	_____

Answer: 900
Answer: 910
Answer: 920
Answer: 930
Answer: 940

#10 Points possible: 10. Total attempts: 0

Simplify:

$\frac{-10x^8 - x^7}{x^3}$ = _____ for $x \neq 0$

Answer: $-10x^5 - x^4$

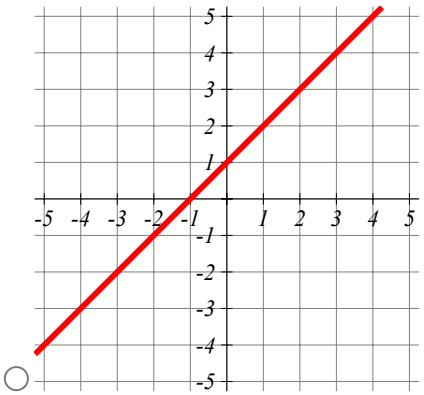
#11 Points possible: 10. Total attempts: 0

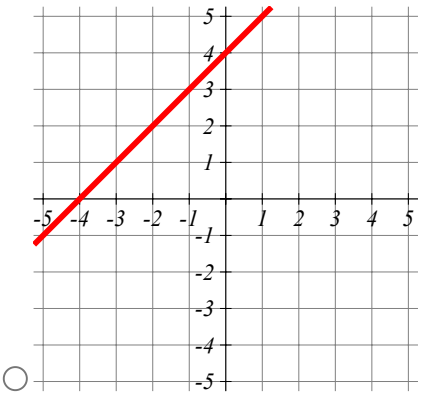
Factor the expression.

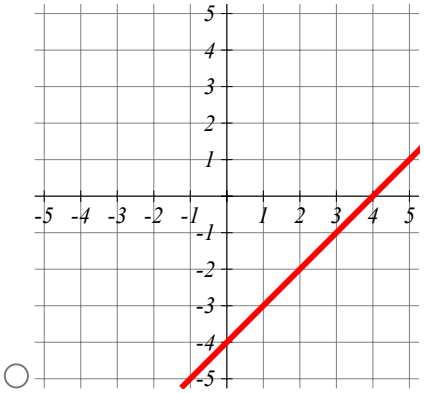
$2x^2 + 15x + 25$ = _____
Answer: $(x + 5)(2x + 5)$

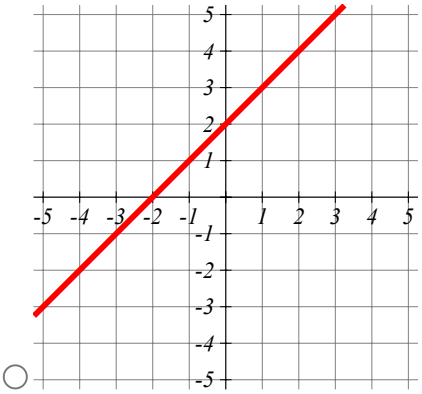
#12 Points possible: 10. Total attempts: 0

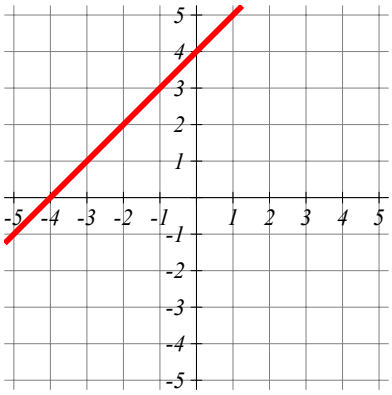
Select the correct graph for the equation $y = 1x + 4$.











Answer:

#13 Points possible: 10. Total attempts: 0

Solve for y:

$7x + 5y = 10$

$y =$ _____

Answer: $-\frac{7}{5}x + 2$

#14 Points possible: 10. Total attempts: 0

The following inequality has a solution in the form $x < A$. Solve the inequality and place the correct value of A into the box.

$-5x + 10 > -8 + 17x$

Enter your answer as an integer or a reduced fraction in the form A/B.

Answer: $x <$ _____

Answer: $\frac{9}{11}$

#15 Points possible: 10. Total attempts: 0

Solve the equation below.

$4(x - 8) - 10 = 22x - 168$

Answer: $x =$ _____

Answer: 7

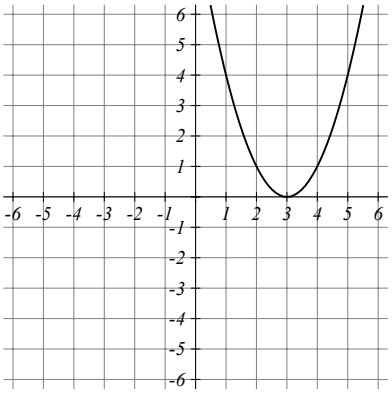
#16 Points possible: 10. Total attempts: 0

Practical Domain and Range
Identify the relevant information given to you in the application problem below. Use that information to answer the questions that follow on Practical Domain and Practical Range. *Round your answers to two decimal places as needed.*
A local towing company charges $8.26 for each mile plus a reservation fee of $10. They tow a maximum of 12 miles. Also, they have the policy that once a reservation is made, if you cancel, the reservation fee is non-refundable. Let C represent the total cost from the towing company and x represent the number of miles driven
Identify the practical domain of this function by filling in the blanks below. Practical Domain: _____ $\leq x \leq$ _____
Identify the practical range of this function by filling in the blanks below. Do **not** include the dollar sign in your answers. Practical Range: _____ $\leq C(x) \leq$ _____

Answer: 0
Answer: 12
Answer: 10
Answer: 109.12

#17 Points possible: 10. Total attempts: 0

Which of the following shows the graph of $y = \frac{1}{3}x^2$?



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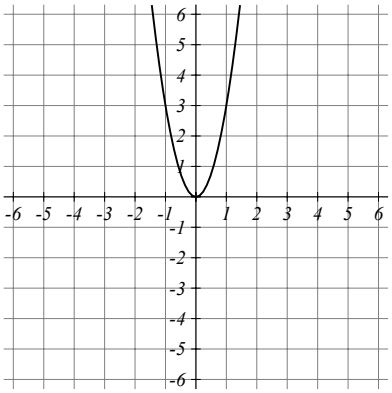

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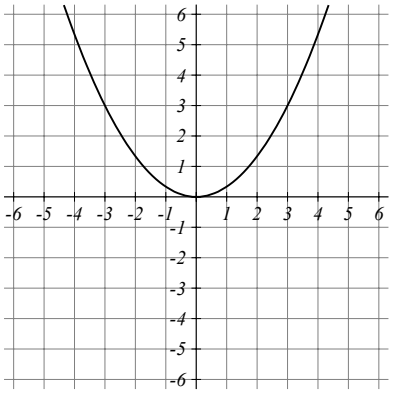

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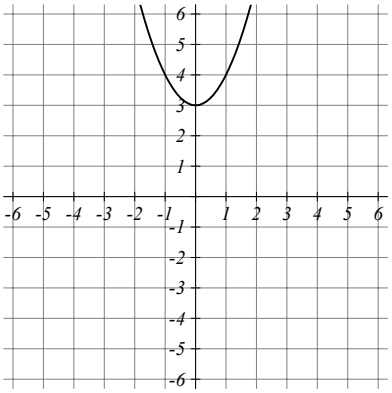

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#18 Points possible: 10. Total attempts: 0

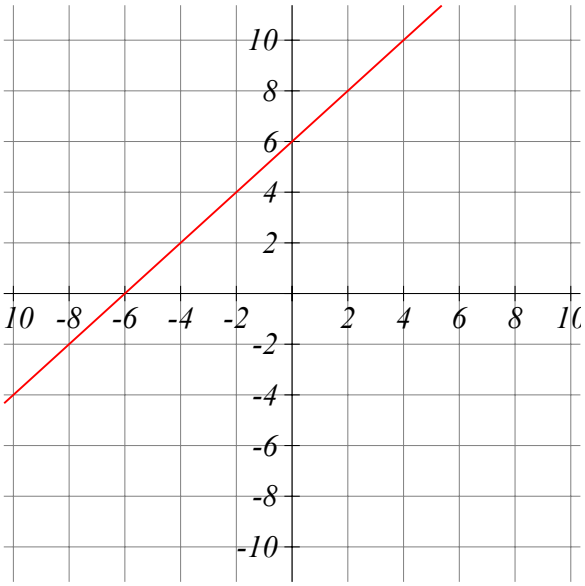
Solve the equation: $m^2 + 1m - 6 = 0$

Answer: $m =$ _____

Write your answers as a list of integers or reduced fractions, with your answers separated by (a) comma(s). For example, if you get 4 and $-\frac{2}{3}$ as your answers, then enter **4,-2/3** in the box.

Answer: 2,-3

#19 Points possible: 10. Total attempts: 0



Write an equation for the graph, where y depends on x.

Answer: $y = 1 \cdot x + 6$

#20 Points possible: 10. Total attempts: 0

Factor the expression completely.

$2x^3 - 50x =$ _____

Answer: $2x(x + 5)(x - 5)$

#21 Points possible: 10. Total attempts: 0

Tournament Qualification Application

Jenna is trying to qualify for the local bowling championship. To qualify, a person must bowl five games and have a combined average score of at least 190. In the first four games, Jenna scores where 186, 188, 175 and 206.

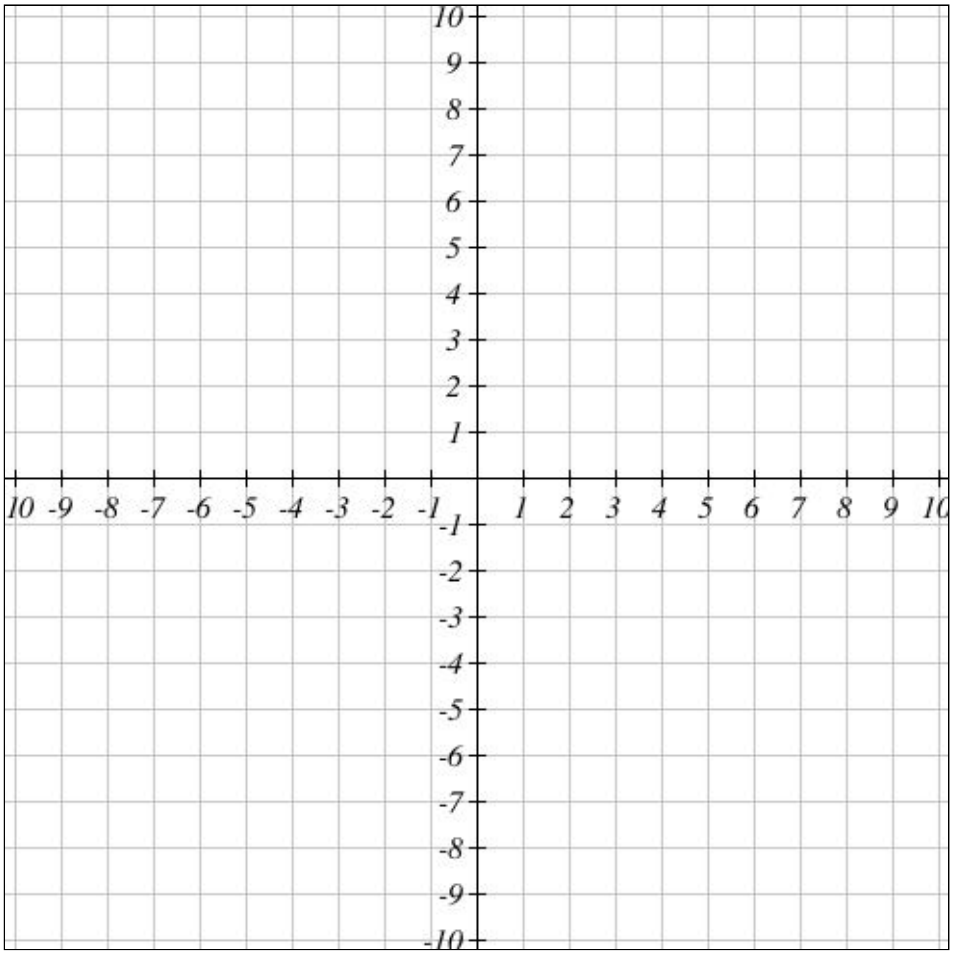
What is the minimum score that Jenna must bowl in her fifth game to qualify for the local bowling championship?

Jenna must bowl at least a _____ in her fifth game to qualify for the local bowling championship.

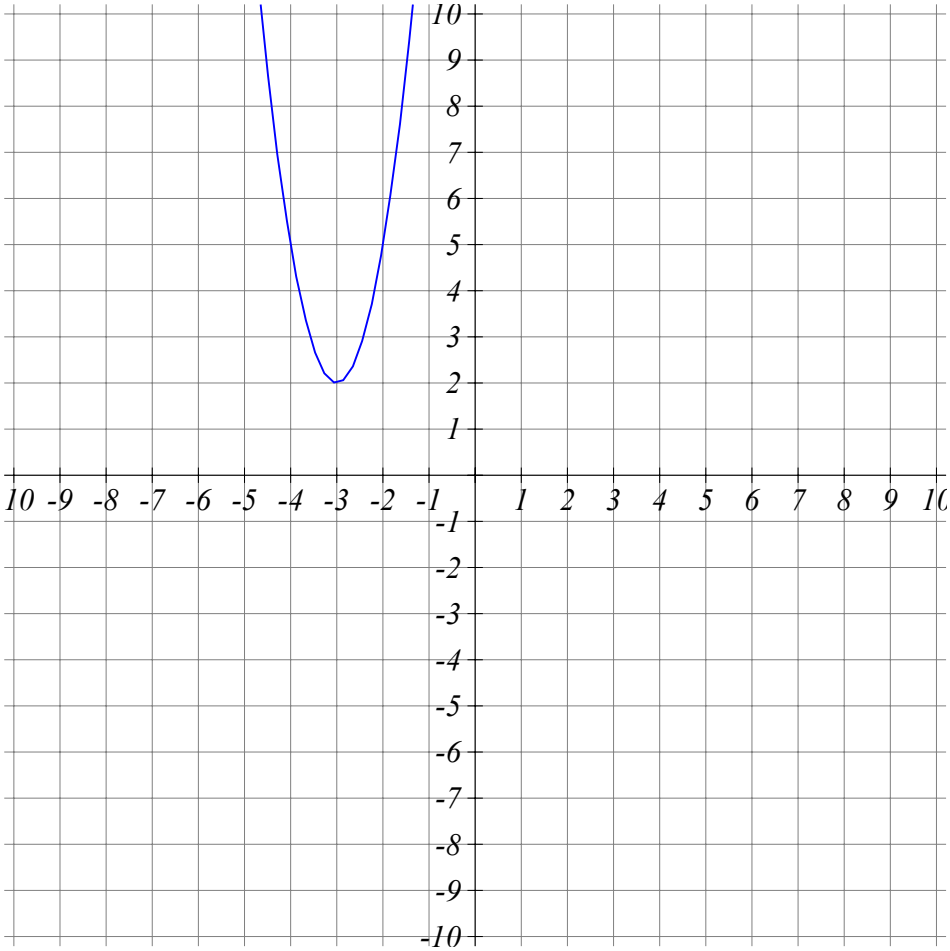
Answer: 195

#22 Points possible: 10. Total attempts: 0

Graph $g(t) = 3(t+3)^2 + 2$.



Answer:



#23 Points possible: 10. Total attempts: 0

If $f(1) = -1$, write an ordered pair that must be on the graph of $y = f(x+3) + 3$

(_____ , _____)

Answer: -2

Answer: 2

#24 Points possible: 10. Total attempts: 0

Linear Equations in General Form

Consider the following equation: $-3x+2y=\ -24$
Enter your answers as integers or reduced fractions.

Vertical Intercept: (_____ , _____)

Horizontal Intercept: (_____ , _____)

Slope = _____

Write the equation $-3x+2y=\ -24$ in slope-intercept the form: $y=mx+b$.
$y=$ _____ $x+$ _____

Preview Vertical Intercept: (,)
Preview Horizontal Intercept: (,)
Preview Slope:
Preview Equation: $y=\quad x+$
Answer: 0
Answer: -12
Answer: 8
Answer: 0
Answer: $\frac{3}{2}$
Answer: $\frac{3}{2}$
Answer: -12

#25 Points possible: 10. Total attempts: 0

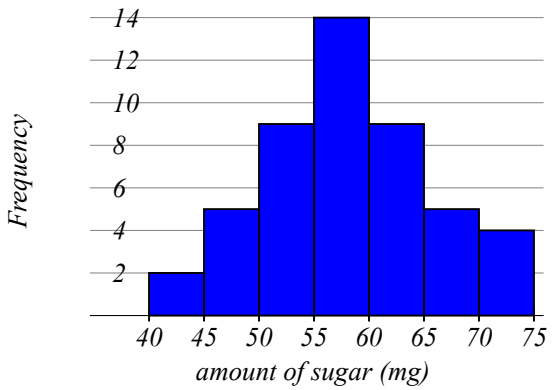
If 108 people attend a concert and tickets for adults cost $3.5 while tickets for children cost $2.75 and total receipts for the concert was $348.75, how many of each went to the concert?

_____ adults

_____ children
Answer: 69
Answer: 39

#26 Points possible: 10. Total attempts: 0

Data was collected for a sample of organic snacks. The amount of sugar (in mg) in each snack is summarized in the histogram below.



What is the sample size for this data set?

$n =$ _____

Answer: The sample size n is 48.

#27 Points possible: 10. Total attempts: 0

Melissa invested 15,900 into two accounts. The amount she put in her money market account was $500 less than twice what she put into a CD. How much did she invest in each account?

Write two linear equations to represent a system to solve this, where x represents the amount invested in CD's and y represents the amount invested in the money market account. Write the equations, but do *not* solve them.

1) _____

2) _____

Answer: $x + y = 15900$ or $y = 2x - 500$
Answer: $x + y = 15900$ or $y = 2x - 500$

#28 Points possible: 10. Total attempts: 0

Find all real solutions of the equation

$2(n-3)^2 - 8 = 172$

Write out the exact answers (no decimal values), with answers separated by a comma.

$n =$ _____

Answer: $3 + 3\sqrt{10}, 3 - 3\sqrt{10}$

#29 Points possible: 10. Total attempts: 0

Find an equation for the line with slope $m = -\frac{12}{7}$ and which goes through the point $(-21, 6)$.

Write your answer in the form $y = mx + b$. Do NOT use decimals as part of your answer...express all parts of your equation in integer or reduced fraction form.

$y =$ _____

Answer: $y = -\frac{12}{7} \cdot x - 30$

#30 Points possible: 10. Total attempts: 0

If a rectangle's length is $2x + 4$ and the width is $3x - 4$, write an expression for the perimeter and an expression for the area.

Perimeter = _____

Area = _____

Answer: $10 \cdot x + 0$

Answer: $6x^2 + 4x - 16$

#31 Points possible: 10. Total attempts: 0

Identifying The Characteristics of Linear and Exponential Functions

Complete the table below. For each function, identify:

1. *The type of function*
2. *It's behavior*
3. *The rate of change or growth/decay factor*
4. *The Vertical Intercept (written as an ordered pair)*

Function	Type and Behavior	Slope or Base	Vertical Intercept
$f(x) = 44x - 120$	Select an answer / Select an answer	Select an answer = _____	_____
$d(y) = 9(3)^y$	Select an answer / Select an answer	Select an answer = _____	_____
$h(x) = 160(0.7)^x$	Select an answer / Select an answer	Select an answer = _____	_____
$p(t) = 240(1.2)^t$	Select an answer / Select an answer	Select an answer = _____	_____
$g(x) = -15x + 220$	Select an answer / Select an answer	Select an answer = _____	_____

Answer: Linear
Answer: Increasing
Answer: Slope
Answer: 44
Answer: $(0, -120)$
Answer: Exponential
Answer: Increasing
Answer: Base
Answer: 3
Answer: $(0, 9)$
Answer: Exponential
Answer: Decreasing
Answer: Base
Answer: 0.7
Answer: $(0, 160)$
Answer: Exponential
Answer: Increasing
Answer: Base
Answer: 1.2

Answer: $(0, 240)$
Answer: Linear
Answer: Decreasing
Answer: Slope
Answer: -15
Answer: $(0, 220)$

#32 Points possible: 10. Total attempts: 0

The surface area of an open-top box with length L, width W, and height H can be found using the formula:

$A = 2LH + 2WH + LW$

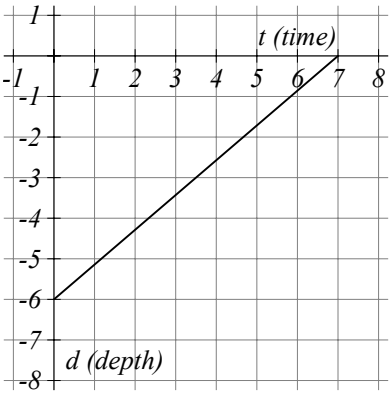
Find the surface area of an open-top box with length 8 cm, width 9 cm, and height 7 cm.

_____ cm^2
Answer: 310

#33 Points possible: 10. Total attempts: 0

Suppose that you are holding your toy submarine under the water. You release it and it begins to ascend. The graph models the depth of the submarine as a function of time.

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

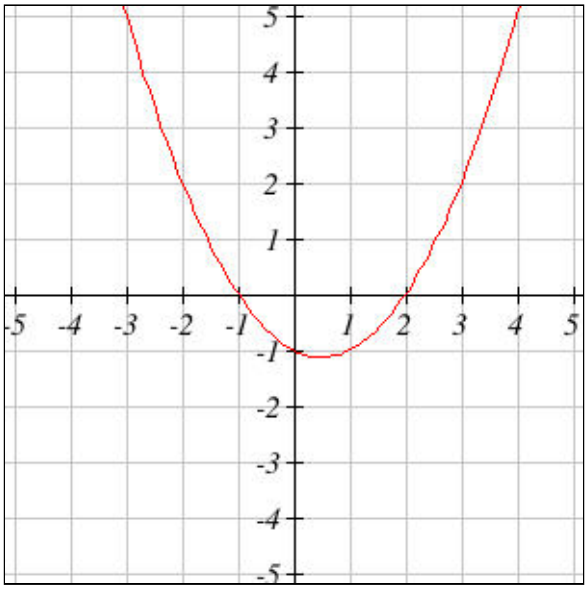


D: _____ $\leq t \leq$ _____

R: _____ $\leq d \leq$ _____
Answer: 0
Answer: 7
Answer: -6
Answer: 0

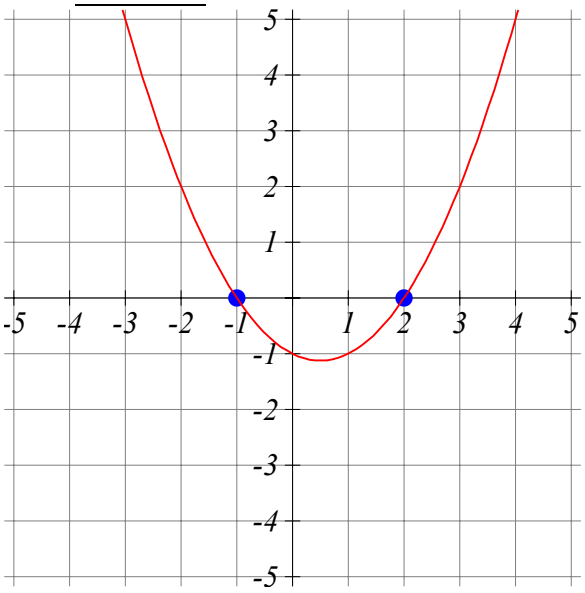
#34 Points possible: 10. Total attempts: 0

Put dots on the graph where the "zeros" can be found. Then list the zeros.



The zero's are _____ .

Answer:



Answer: 2,-1

#35 Points possible: 10. Total attempts: 0

Writing and using Linear Functions Given the slope and a point - Application

Identify the information given to you in the application problem below. Use that information to answer the questions that follow.

Round your answers to two decimal places as needed.

Tim found a piggy bank in the back of his closet that he hadn't seen in years. He decided to use it to save up for a summer vacation by depositing $63 in the piggy bank every month. After three months, he counted the amount of money in the piggy bank and found he had 210 dollars.

How much money did Tim have in the piggy bank before he started making monthly deposits?

Tim had $_____ in the piggy bank before he started making monthly deposits.

Write a Linear Function that represents this situation. Write your function in the form of $S(t) = mt + b$ where $S(t)$ represents the amount of money in the piggy bank after t months of saving.

Linear Function: $S(t) =$ _____

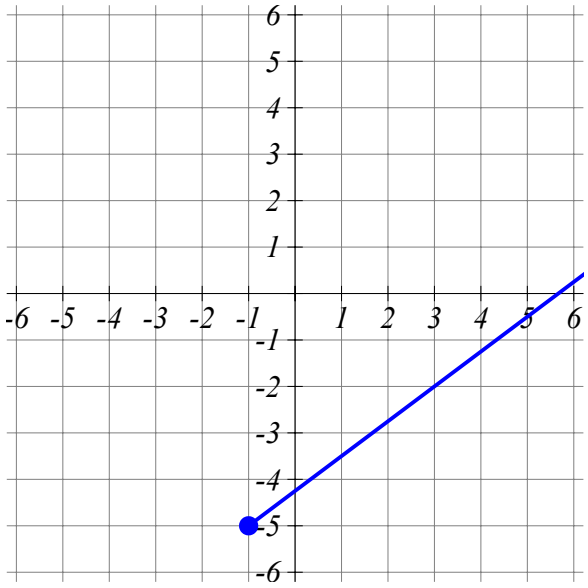
Tim decides he needs 714 dollars for his vacation. Find the value of t where $S(t) = 714$. Write your answer as an Ordered Pair: _____

Complete the following sentence to explain the meaning of the Ordered Pair.

After depositing $63 per month for _____ months, Tim will have enough money for his vacation.

Answer: 21
Answer: $63t + 21$
Answer: $(11, 714)$
Answer: 11

#36 Points possible: 10. Total attempts: 0



Write the domain of the function using interval notation. Example: [2,3) or (-oo,5). Enter -oo for negative infinity and oo for infinity.

NOTE: If you do not see an endpoint, assume that the graph continues forever in the same direction.

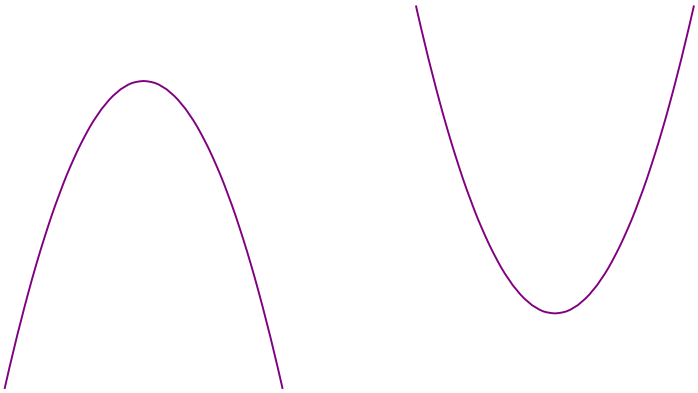
The domain is: _____

Answer: [-1,oo)

#37 Points possible: 10. Total attempts: 0

Consider the function: $f(x) = -2x^2 + 28x - 80$

The direction of the graph is like which of the following:

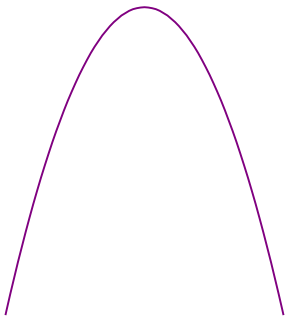


The y-intercept is at $y =$ _____

The x-intercepts are at $x =$ _____

The vertex is at the point _____

YOU SHOULD PRACTICE DRAWING THIS GRAPH ON YOUR OWN PAPER TO BE SURE IT LOOKS RIGHT!



Answer:
Answer: -80
Answer: +10,+4
Answer: $(7, 18)$

#38 Points possible: 10. Total attempts: 0

Which shows the Commutative Property of Multiplication?

- ○ $6 \times 0 = 0$
- ○ $6 \times 1 = 6$
- ○ $6 \times 4 = 4 \times 6$
- ○ $(6 \times 4) \times 1 = 6 \times (4 \times 1)$

Answer: $6 \times 4 = 4 \times 6$

#39 Points possible: 10. Total attempts: 0

A) $x^7 \cdot x^5 = x^p$ where p= _____

B) $\left(x^7\right)^5 = x^r$ where r= _____

Answer: 12
Answer: 35

#40 Points possible: 10. Total attempts: 0

Consider the line with the equation: $-5y - 4x = -5$

Give the equation of the line parallel to Line 1 which passes through $(-6, 3)$: _____

Give the equation of the line perpendicular to Line 1 which passes through $(-6, 3)$:

_____

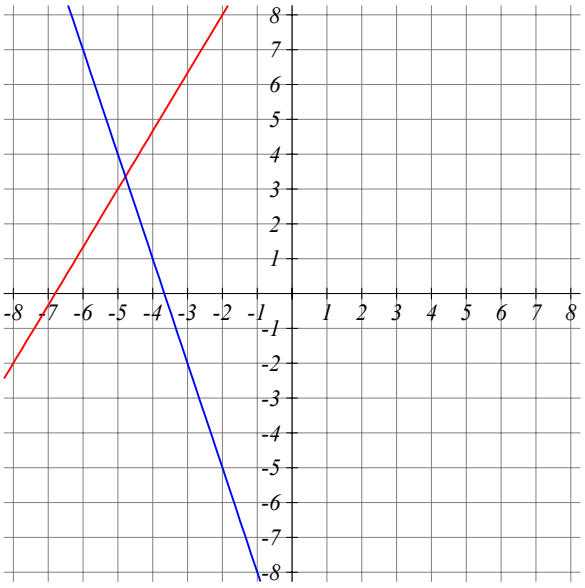
Answer: $y = -\frac{4}{5}x - \frac{9}{5}$
Answer: $y = \frac{5}{4}x + \frac{21}{2}$

#41 Points possible: 10. Total attempts: 0

Linear Application
In the year 1984, an investment was worth \$33800. In the year 1989, this investment was worth \$41800. The value of this investment is Select an answer at a rate of _____ Select an answer

Answer: increasing
Answer: 1600
Answer: dollars per year

#42 Points possible: 10. Total attempts: 0



a) Is $(-5, 3)$ a solution to the red line? ○ True ○ False

b) Is $(-5, 3)$ a solution to the blue line? ○ True ○ False

c) Is $(-5, 3)$ a solution to the system? ○ True ○ False
Answer: True
Answer: False
Answer: False

#43 Points possible: 10. Total attempts: 0

Solutions to Inequalities

Determine which of the following are true statements. Check all that apply.

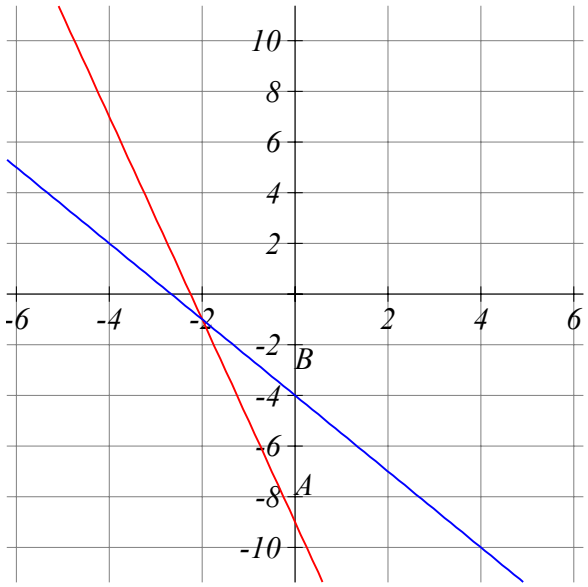
- ☐ $(-10, 3)$ is a solution to $-3x - 4y \leq 14$
- ☐ $(-5, -7)$ is a solution to $7x - 10y \geq 35$
- ☐ $(-8, -4)$ is a solution to $-x - 5y > 30$
- ☐ $(7, 10)$ is a solution to $-2x + 3y < 18$

Answer:
$(7, 10)$ is a solution to $-2x + 3y < 18$
$(-5, -7)$ is a solution to $7x - 10y \geq 35$

#44 Points possible: 10. Total attempts: 0

Consider the following system of equations and its graph:

$$\begin{cases} -4x - y &= 9 \\ -3x - 2y &= 8 \end{cases}$$



A) What is the solution of the system?

Answer: $(x, y) = (\_\_\_\_\_, \_\_\_\_\_)$

B) In the boxes below, enter either the letter A or B to match the equation to the graph shown.

[-] $-3x - 2y = 8$	a. Graph A (red)
[-] $-4x - y = 9$	b. Graph B (blue)

Answer: -2
Answer: -1
Answer: b a

#45 Points possible: 10. Total attempts: 0

Select the correct reason for each step in solving the equations given in Step 1.

	Steps	Reasons
1.	$4(2x-4)+25=4x+29$	Given
2.	$8x-16+25=4x+29$	Select an answer
3.	$8x+9=4x+29$	Select an answer
4.	$4x+9=29$	Select an answer
5.	$4x=20$	Select an answer
6.	$\frac{4x}{4}=\frac{20}{4}$	Select an answer
7.	$x=5$	Select an answer

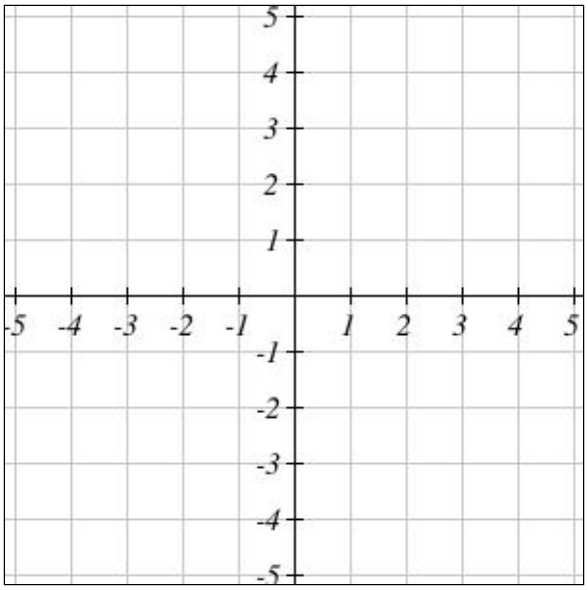
Answer: Distributive Property
Answer: Combine Like Terms
Answer: Subtraction Property
Answer: Subtraction Property
Answer: Division Property
Answer: Simplify

#46 Points possible: 10. Total attempts: 0

Fill in the t-table below for the equation. Then graph the line on the grid by selecting two of the points from your table.

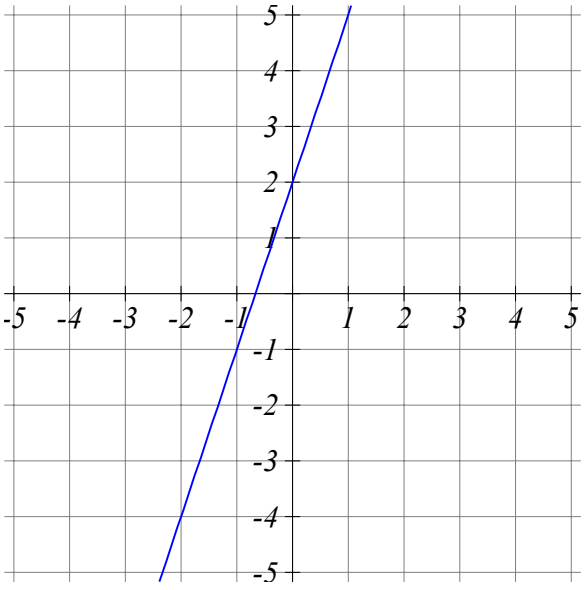
$y = 3x + 2$

x	y
-1	_____
0	_____
1	_____



Answer: -1
Answer: 2
Answer: 5

Answer:



#47 Points possible: 10. Total attempts: 0

Multiply and simplify completely:

$(3x - 2)(3x + 4)$

Answer: $9 \cdot x^2 + 6 \cdot x - 8$

#48 Points possible: 10. Total attempts: 0

Given the formula for force, $F = ma$, which answer would you get if you solve for a?

- ○ $a = F + m$
- ○ $a = F \cdot m$
- ○ $a = F - m$
- ○ $a = \dfrac{F}{m}$

Answer: $a = \dfrac{F}{m}$

#49 Points possible: 10. Total attempts: 0

Finding an Appropriate Equation Given Data

For each table below, determine if it represents a function that is linear or exponential. Then determine the actual function.

x	0	1	2	3
f(x)	70	49	34.3	24.01

f(x) is Select an answer
f(x) = _____

x	0	1	2	3
g(x)	-133	-233	-333	-433

g(x) is Select an answer
g(x) = _____

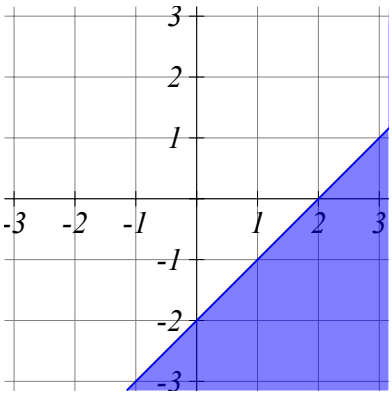
x	0	1	2	3
h(x)	180	216	259.2	311.04

h(x) is Select an answer
h(x) = _____

Answer: Exponential
Answer: $70(0.7)^x$
Answer: Linear
Answer: $-100x - 133$
Answer: Exponential
Answer: $180(1.2)^x$

#50 Points possible: 10. Total attempts: 0

Plot



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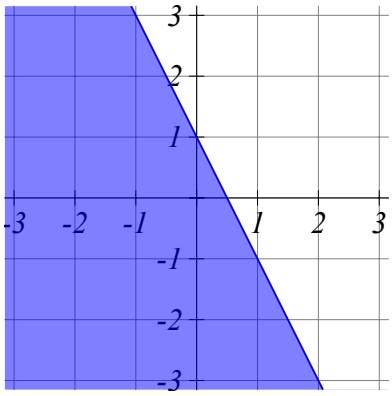

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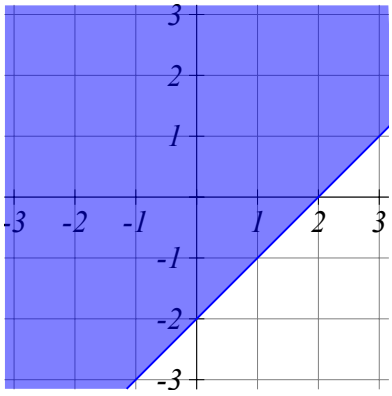


-

Inequality

a. $x \geq y + 2$

b. $y + 2x \geq 1$

c. $y \leq x + 2$

d. $y + 2x \leq 1$

e. $y \geq x - 2$

f. $x \geq y - 2$

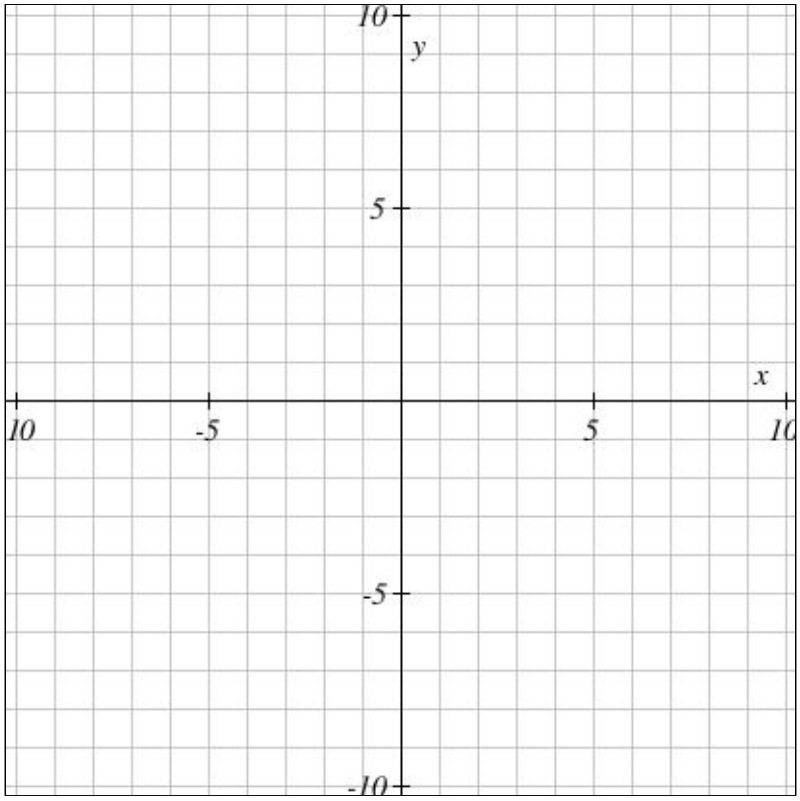
g. $2y + x \leq 1$

Answer: a d e

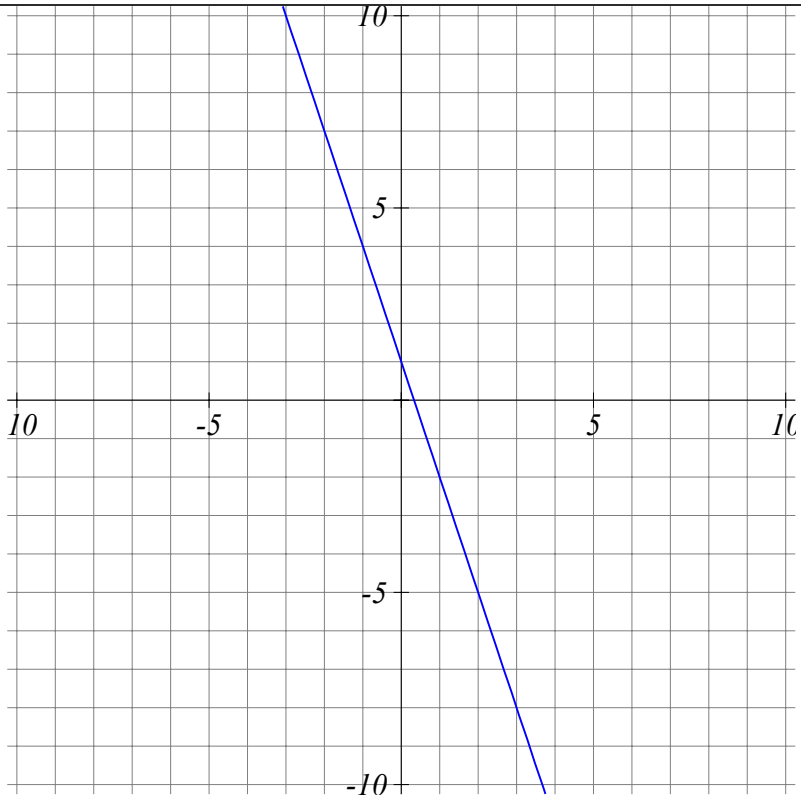
#51 Points possible: 10. Total attempts: 0

Graphing Linear Functions using the slope.

A line has a slope of -3 and contains the point $(1, -2)$.
Use this information to graph the line



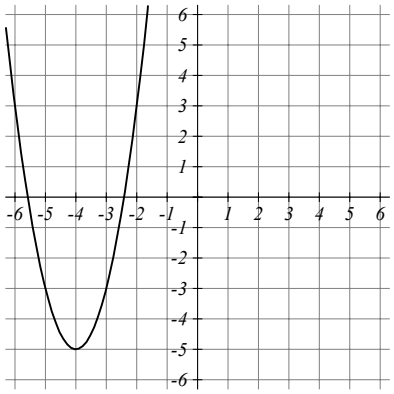
Answer:



#52 Points possible: 10. Total attempts: 0

Match the function with its graph.

$y = 2(x+4)^2 - 5$



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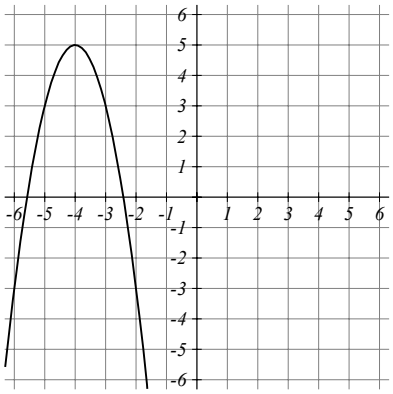

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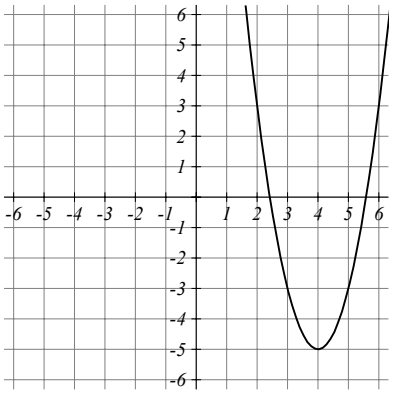

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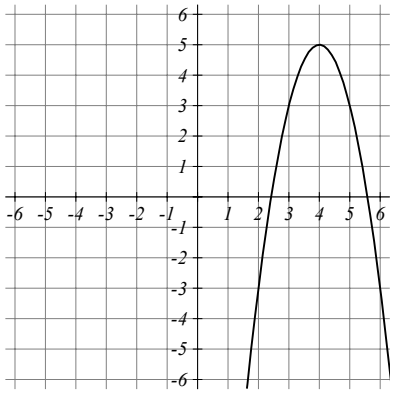


○

#53 Points possible: 10. Total attempts: 0

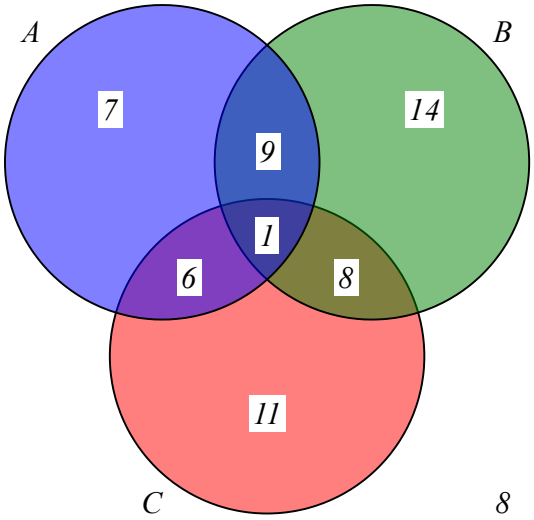
Inequalities
Determine which statement matches each inequality.

- $x \leq 10$	a. Summer is working to earn more than \$10
- $x > 10$	b. Summer must work at least 10 hours
- $x \geq 10$	c. Summer can own up to 10 fish
- $x < 10$	d. Summer gets a discount until she is 10 years old

Answer: c a b d

#54 Points possible: 10. Total attempts: 0

The Venn diagram here shows the cardinality of each set. Use this to find the cardinality of the given set.



n(A ∪ B)= _____

Answer: 45

#55 Points possible: 10. Total attempts: 0

y varies directly as x. If $x = 7$ then $y = 8$. Find y when $x = 6$.

$y =$ _____

Answer: $\frac{48}{7}$

#56 Points possible: 10. Total attempts: 0

Movie Tickets
Tickets to a 3D movie cost $12 for an adult and $10 for each child. A total of $614 was collected in ticket sales for the 7:15PM show.
Write a linear equation in general form to represent this situation. Let C represent the number of children's tickets and A represent the number of adult tickets sold. Equation: _____ If 42 adult tickets were sold, how many children were there? There were _____ children at the movie.

Answer: $10C + 12A = 614$
Answer: 11
