ALGEBRA I EOC

REVIEW BOOK

Name: ______________________________

Teacher's Name: ________________________

Test Date: Tuesday May 3, 2016

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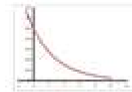
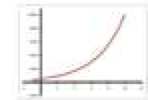
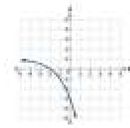
1. Which of the following graphs represents exponential decay?

a. 

b. 

c. 

d.

2. The amount of bacteria from the school water fountain is expected to double each week. Which equation can be used to represent this problem situation?

a. $y = 2(.03)^x$

b. $y = 4(2)^x$

c. $y = 3(\frac{1}{2})^x$

d. $y = 2(5)^x$

3. Which y-intercept and asymptote describes the exponential function below?

$$y = 40(\tfrac{1}{2})^x$$

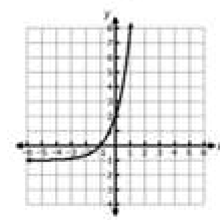
a. y-intercept: 100
asymptote: $y = 40$

b. y- intercept 40
asymptote: $y = \frac{1}{2}$

c. y-intercept: 100
asymptote: $x = 0$

d. y-intercept: 40
asymptote: $y = 0$

4. What is the domain and range for the exponential function below?



a. Domain: $y > -1$
Range: $-\infty < x < \infty$

b. Domain: $-\infty < x < \infty$
Range: $y \geq -1$

c. Domain: $-\infty \leq x \leq \infty$
Range: $y > -1$

d. Domain: $x > -1$
Range: $-\infty \leq y \leq \infty$

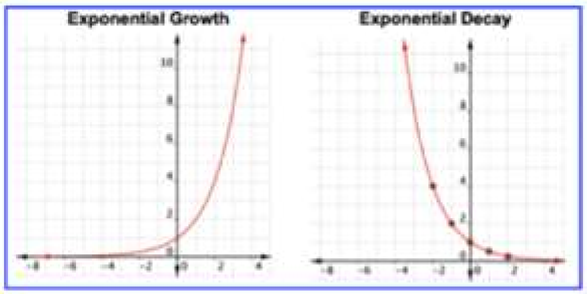
Exponential Growth and Decay

$$y = a(b)^x$$

Initial value

Growth or Decay Factor

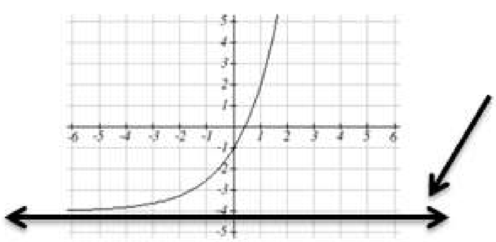
Exponential Growth vs. Exponential Decay:



- GROWTH: when $a > 0$ and $b > 1$
- DECAY: when $a > 0$ and b is between 0 and 1.

KEY FEATURES:

- Every exponential graph has a horizontal asymptote (y =   ) that the graph will never cross.



-Horizontal asymptote: $y = -4$

-The graph will never touch or cross this line.

- Domain: $-\infty \le x \le \infty$ (all real numbers)
- Range: $y > -4$ **use the value from your asymptote**
    - Since the graph never passes $y = -4$ you NEVER use $\geq$

STAAR ALGEBRA I REFERENCE MATERIALS

FACTORING	
Perfect square trinomials	$a^2 + 2ab + b^2 = (a + b)^2$ $a^2 - 2ab + b^2 = (a - b)^2$
Difference of squares	$a^2 - b^2 = (a - b)(a + b)$
PROPERTIES OF EXPONENTS	
Product of powers	$a^m a^n = a^{(m+n)}$
Quotient of powers	$\frac{a^m}{a^n} = a^{(m-n)}$
Power of a power	$(a^m)^n = a^{mn}$
Rational exponent	$a^{\frac{m}{n}} = \sqrt[n]{a^m}$
Negative exponent	$a^{-n} = \frac{1}{a^n}$
LINEAR EQUATIONS	
Standard form	$Ax + By = C$
Slope-intercept form	$y = mx + b$
Point-slope form	$y - y_1 = m(x - x_1)$
Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
QUADRATIC EQUATIONS	
Standard form	$f(x) = ax^2 + bx + c$
Vertex form	$f(x) = a(x - h)^2 + k$
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Axis of symmetry	$x = \frac{-b}{2a}$

Problem Solving Strategy

Question – Underline the question.

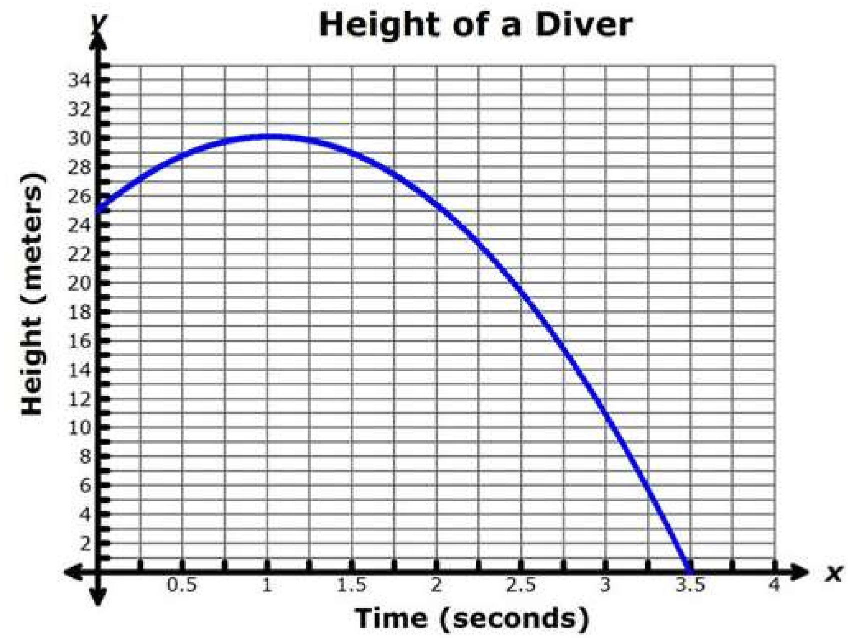
Data – Circle important words and numbers.

Plan – How should I answer this question?

Answer – Follow the plan.

Check – Does your answer make sense?

Quadratic Real World Application



1. At what height did the diver begin?

2. When will the diver hit the water?

3. What is the maximum height the diver reached? When did she reach it?

4. Find the domain and range for this problem situation.

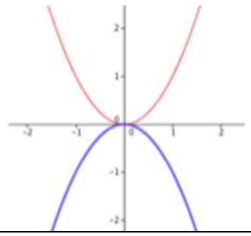
Quadratic Transformations

Quadratic Parent function: $f(x) = x^2$

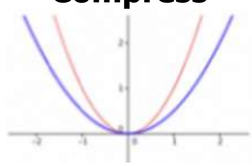
Types of Transformations

red graph represents the parent function

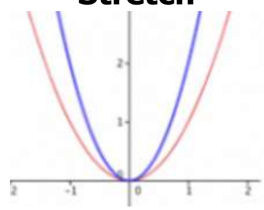
Reflection



Compress

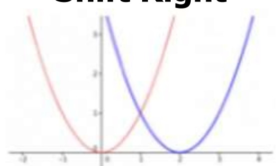


Stretch

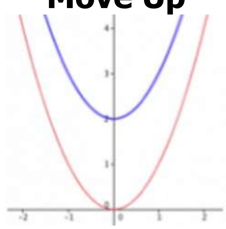


Shift Left

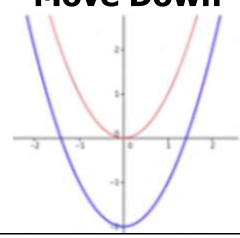
Shift Right



Move Up



Move Down



Compare each equation to the quadratic parent function. Circle all that apply.

1. $y = 2(x + 3)^2 - 4$

reflects

compress stretch

moves left moves right

moves up moves down

2. $y = \frac{1}{2}(x - 5)^2 + 3$

reflects

compress stretch

moves left moves right

moves up moves down

Calculator Strategies

"Calculate" Scratchpad:

Calculator Steps	Use
2^{nd} + 7 1 2 enter	Clear calculator
MATH enter enter	Convert to fraction
MATH 2 enter enter	Convert to decimal
ALPHA Y= enter	Create fraction
Up Up Enter	Copy previous work to make edits

"Graph" Scratchpad:

Calculator Steps	Use
2^{nd} GRAPH	Table
TRACE	Trace a graph to find points
2^{nd} TRACE 5 enter x3	Solution to a system
2^{nd} TRACE 2 Shift left enter Shift right enter enter	x-intercepts
2^{nd} TRACE 3 Shift left enter Shift right enter enter	Minimum of a quadratic
2^{nd} TRACE 4 Shift left enter Shift right enter enter	Maximum of a quadratic

Solving Equations

(With 1 variable)

Example:

$3x + 4 = 2x - 9$

Important things

to remember:

Check in calculator:

1. $2x + 4 = 12$	2. $-(4c - 8) = c + 2(3c - 1)$
3. $4y - 2 + y = y + 6$	4. $-5(r - 3) + 4 = 0$
5. $\frac{-1}{2}(s - 4) = 7$	6. $0.5(a - 1) = a + 3(a + 3)$

Quadratic Formula (continued)

$x^2 - 7x = -10$ a=_____ b=_____ c=_____

$$x = \frac{\quad \pm\sqrt{(\ \ )^2 - 4(\ \ )(\ \ )}}{2(\ \ )}$$

$$x = \frac{\quad + \sqrt{\quad}}{2} = \qquad x = \frac{\quad - \sqrt{\quad}}{2} =$$

$x = \{ \quad , \quad \}$

$10x^2 + 19x = 15$ a=_____ b=_____ c=_____

$$x = \frac{\quad \pm\sqrt{(\ \ )^2 - 4(\ \ )(\ \ )}}{2(\ \ )}$$

$$x = \frac{\quad + \sqrt{\quad}}{2} = \qquad x = \frac{\quad - \sqrt{\quad}}{2} =$$

$x = \{ \quad , \quad \}$

Quadratic Formula

Given $ax^2 + bx + c = 0$ *MUST = 0 OR = Y !!!!*

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example: $4x^2 + 11x - 20 = 0$

a=_____ b=_____ c=_____

$$x = \frac{\pm\sqrt{(\ \ )^2 - 4(\ \ )(\ \ )}}{2(\ \ )}$$

$$x = \frac{+\sqrt{\quad}}{2} = \qquad\qquad x = \frac{-\sqrt{\quad}}{2} =$$

$x = \{ \quad , \quad \}$

Calculator Strategies:

- Use ALPHA Y= to create a fraction.
- Use 2nd x^2 to get $\sqrt{\ }$.

Solving Equations Practice

1. $3x - 5 = -8$
2. $10 = 24 - 7x$
3. $\frac{m}{2} - 8 = 12$
4. $\frac{5}{6}x - 12 = 3$
5. $5x + 19 = 6x + 12$
6. $8y - 10 = 6y - 2$
7. $x - 7 = 3x + 7$
8. $5x - 40 = 8 - x$

9. Explain how to solve the following by hand:

$$\mathbf{0.5(2x - 7) + x - 1 = 14 + 3(2x)}$$

Solving Inequalities

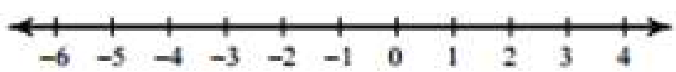
Steps:	Important things to Remember:
1. Draw line 2. Box variable 3. Start moving: undo operations • Add ⟷ Subtract • Multiply ⟷ Divide	• Variable must be alone before you can divide! • Sign flips when diving by a negative $<, >$ *open circle* ○ $\leq, \geq$ *closed circle* ●

Example:

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

Practice: Solve the following & graph them on a number line.

2) $6x + 2 + 6x < 14$



Attributes of Quadratic Functions (continued)

Calculator Strategy: Graph//TRACE

$y = -x^2 + 18x - 75$

Vertex:

Maximum or Minimum?

Axis of symmetry:

Root(s):

y-intercept:

$f(x) = \frac{3}{4}(x + 4)^2 + 3$

Vertex:

Maximum or Minimum?

Axis of symmetry:

Zero(s):

y-intercept:

$f(x) = x^2 - 2x - 3$

Vertex:

Maximum or Minimum?

Axis of symmetry:

Solution(s):

y-intercept:

$y = -\frac{1}{4}(x - 1)^2 + 4$

Vertex:

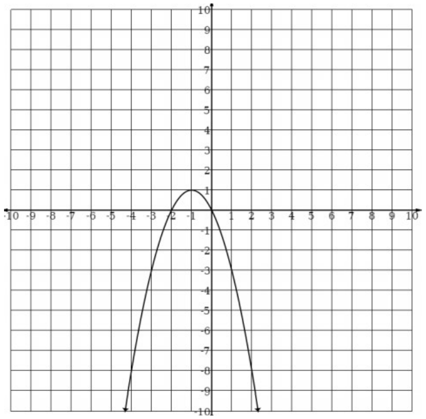
Maximum or Minimum?

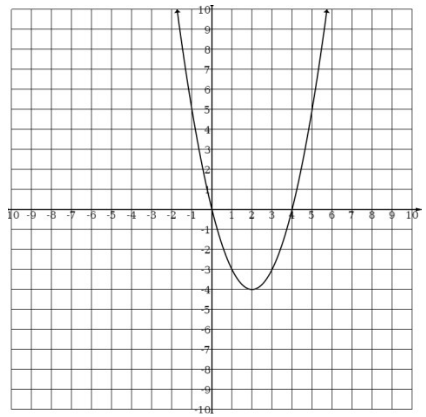
Axis of symmetry:

x-intercept(s):

y-intercept:

Attributes of Quadratic Functions





Vertex:

Maximum or Minimum?

Axis of symmetry:

x-intercept(s):

y-intercept:

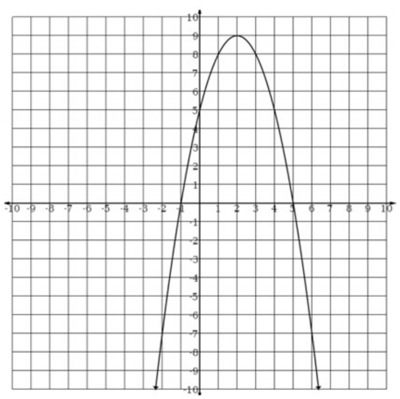
Vertex:

Maximum or Minimum?

Axis of symmetry:

x-intercept(s):

y-intercept:



Vertex:

Maximum or Minimum?

Axis of symmetry:

x-intercept(s):

y-intercept:

Solving Inequalities Practice

Solve following linear inequalities

1. $2x - 2 > 5 + 6x$ **2.** $6y - 2 \leq 2y$

3. $3x \leq 2x + 5$ **4.** $6x + 5 \geq 4 - 4x$

5. $6x - 2 < 3$ **6.** $2x - 5 > 6x + 3$

Solve and graph the solution set of following

7. $8y \geq 5$ **8.** $5y - 9 \leq 2y + 7$

9. $5y < 8 - 7$ **10.** $3y \geq -8$

Challenge:

$$-2(2 - 2x) - 4(x + 5) \leq -24$$

Intro to Functions: Function Notation

Important Facts:

- Relation is a ____________________ that can be represented in 4 different ways.
- X's CANNOT repeat.

Function Notation: $f(x) = y \longleftarrow$ **Output/ Range**

Input/ Domain

1. What is the range of the function $f(x) = 2x + 7$ when the domain is {1, 3, 5}?

2. What is the range of the function $f(x) = \frac{3}{2}(x+2)$ when the domain is {-4, -2, 2}?

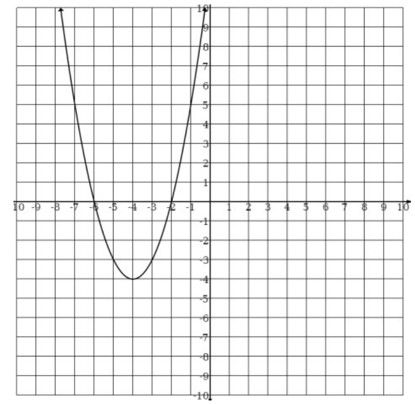
3. What is the domain of the function $f(x) = 3x - 1$ when the range is {-10, -1, 5}?

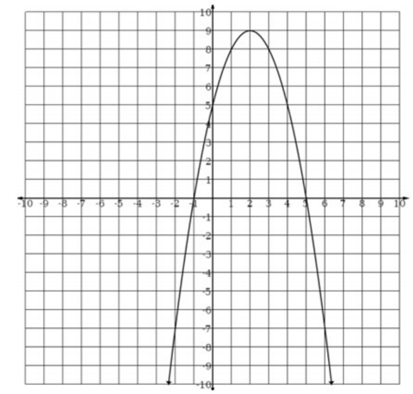
4. What is the domain of the function $f(x) = x^2 + 4$ when the range is {5, 8, 13}?

---

1) $f(x) = 3x - 8$	2) $f(x) = 2 - 4x$	3) $g(x) = 7 - x$
a. $f(1) =$	a. $f(-5) =$	a. $g(-6) =$
b. $f(-3) =$	b. $f(-2) =$	b. $g(-4) =$
c. $f(5) =$	c. $f(0) =$	c. $g(-2) =$
d. $f(-6) =$	d. $f(4) =$	d. $g(4) =$
e. $f(0) =$	e. $f(6) =$	e. $g(5) =$
D:	D:	D:
R:	R:	R:

Domain & Range of Quadratics





Domain:

Range:

Domain:

Range:

$y=2x^2 - 3x - 2$

Domain:

Range:

$f(x)= -x^2 - 7x - 6$

Domain:

Range:

$y=(x+3)^2 + 1$

Domain:

Range:

$f(x)= -\frac{1}{2}(x-4)^2 - 2$

Domain:

Range:

Quadratic Functions Vocabulary

Axis of symmetry: vertical line through vertex; x=____

Maximum: highest point on a parabola

Minimum: lowest point on a parabola

Parabola: shape of a quadratic function; a "u"-shape

Quadratic parent function: $y = x^2$

Standard Form: $y = ax^2 + bx + c$

Vertex Form: $y = a(x - h)^2 + k$

Vertex: highest or lowest point of a parabola

Compression: parabola becomes wider

Stretch: parabola becomes narrower

Root/Zero/Solution: another name for x-intercept

Quadratic Formula: formula to find x-intercepts/solutions

X-intercept: point where graph crosses the x-axis (x, 0)

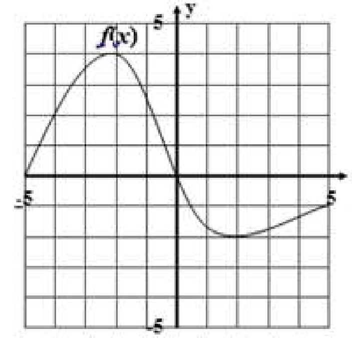
Y-intercept: point where graph crosses the y-axis (0, y)

Domain: x-values

Range: y-values

Intro to Functions: Function Notation Practice

Given this graph of the function f(x):



Find:

a. $f(-2) =$ **b.** $f(0) =$ **c.** $f(3) =$ **d.** $f(-5) =$

e. x when $f(x) = 2$ **f.** x when $f(x) = 0$

Fill in the table for the function from the given domain.

$f(x) = 3 - 4x$

x *input*	*f(x)* *output*
-2	
-1	
0	
1	
2	

$f(x) = 2x - 1$

x *input*	*f(x)* *output*
-2	
-1	
0	
1	
2	

$f(x) = 6 + 0.5x$

x *input*	*f(x)* *output*
-4	
-2	
0	
2	
4	

Domain & Range

Domain:
- X-Values
- Left to Right
- Input Values

D | R

Range:
- Y-Values
- Bottom to Top
- Output Values

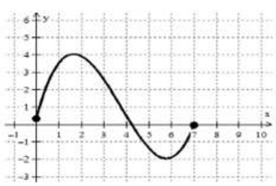
Arrows = INFINITY

Notation:

Continuous Graph: (no holes in the graph)

$\leq x \leq$

$\leq y \leq$



Domain:

Range:

Discrete (only points or dots, table or mapping)

x: { , } list of numbers

y: { , } list of numbers

x	y
0	0
1	1
2	4
3	9
4	16

Domain:

Range:

Adding & Subtracting Polynomials (continued)

4. Simplify the following expression: $4x(2x + 5) - (2x + 7)$
   a. $8x^2 + 20x + 2x + 35$
   b. $8x^2 + 18x - 7$
   c. $6x^2 + 18x + 12$
   d. $-8x^2 - 10x + 7$

5. Simplify the following expression: $3w(\frac{1}{2}w + 2) + 4(\frac{5}{8}w - 3)$
   a. $\frac{3}{2}w + 2 + \frac{20}{8}w - 3$
   b. $\frac{3}{2}w^2 + 6 + \frac{20}{8}w - 3$
   c. $\frac{3}{2}w^2 + \frac{17}{2}w - 12$
   d. $\frac{1}{2}w^2 + \frac{5}{8}w - 12$

6. Simplify the following expression: $-2(\frac{5}{2}x - 6) + 3x(\frac{1}{2}x + 4)$
   a. $5x^2 + \frac{3}{2}x - 12$
   b. $\frac{3}{2}x^2 + 7x + 12$
   c. $-\frac{3}{2}x^2 + 17x - 2$
   d. $-5x^2 + 12x + 4$

7. Simplify the following expressions: $-2f(f + 3) - 8(2f + 10)$
   a. $-2f^2 - 16f$
   b. $2f^2 - 22f - 80$
   c. $-2f^2 - 22f - 80$
   d. $-2f^2 + 16f + 30$

CALCULATOR STRATEGIES:

- Graph the original expression followed by each answer choice (A, B, C, D) choose the answer that is the exact same as the original graph.

Adding & Subtracting Polynomials

Adding Polynomials:

1. Remove the ________________ and rewrite each term.
2. Combine _______________. Like terms have the same ________________ and _________________.

Examples:

1. $(3x^2 + 4x - 10) + (-6x^2 - 2x + 4)$

2. $(2m^2 - m) + (4m^2 + 8m - 1)$

Subtracting Polynomials:

1. Remove parenthesis from __________ expression and rewrite each term.
2. Remove the parenthesis from second expression and change each term to its __________________ sign.
3. Combine like terms.

Examples:

1. $(4w^2 + 2w) - (6w^2 + 8w - 6)$ 2. $(3e^2 - 5e + 2) - (-10e^2 + 4e + 1)$

YOUR TURN!

1. $(2e^2 + 3e + 10) + (-8e^2 + 11)$ 2. $(10g^3 + g^2 - 4g) - (-2g^3 + g + 12)$

3. The area of rectangle ABCD is represented by the expression $3x^2 + 4x - 15$. The area of rectangle WXYZ is represented by the expression $8x^2 - 6x + 10$. Write an expression that represents the combined area of the rectangles.

Domain & Range Practice:

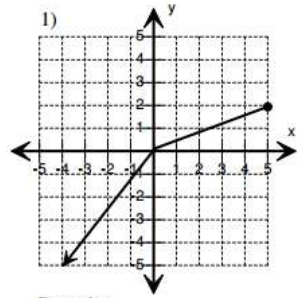
Find the domain and Range of coordinates and decide whether it is a function.

1. (2,-3) (-5,8) (-5,6) (0,7) Domain :__________Range__________Is it function ? ___

2. (0,-5) (-1,4.5) (-5,6.8) (0,7) Domain :___________Range__________ Is it function ? ___

Find the Domain and Range for each graph.

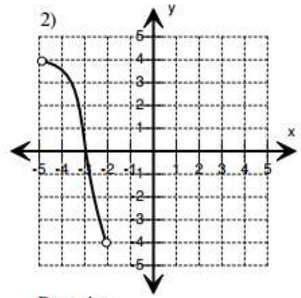
1)



Domain : _______________

Range : _______________

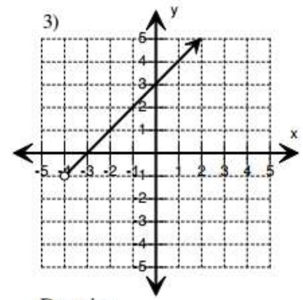
2)



Domain : _______________

Range : _______________

3)



Domain : _______________

Range : _______________

Identify the domain and range of the function.

3.

Input	Output
1	8
3	7
5	6
7	5

4.

Input	Output
7	4
2	2
5	1
3	5

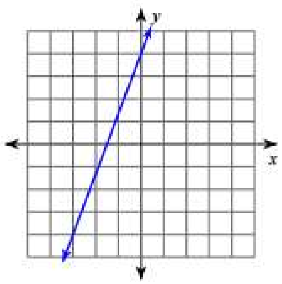
5.

Input	Output
0.4	15
0.5	13
0.6	11
0.7	9

Slope (Rate of Change)

Graph:	Table:	Ordered Pairs:
Slope Intercept Form:	Standard Form:	Point Slope Form:

Examples:

<table>
<tr>
<td></td>
<td>
<table>
<tr><th>x</th><th>y</th></tr>
<tr><td>–3</td><td>5</td></tr>
<tr><td>–2</td><td>2</td></tr>
<tr><td>–1</td><td>–1</td></tr>
<tr><td>0</td><td>– 4</td></tr>
<tr><td>1</td><td>–7</td></tr>
</table>
</td>
<td>$(18, -5), (18, 20)$</td>
</tr>
<tr>
<td>y= 5x – 6</td>
<td>3x – 2y= 12</td>
<td>$y + 4 = \frac{-5}{2}(x - 3)$</td>
</tr>
</table>

Calculator Strategies:

y= graph   f(x)= graph   table of values= 2^{nd} GRAPH

Convert to fraction: MATH enter enter

Fraction to Decimal: MATH 2 enter enter

Factoring-Box Method (continued)

3. $(x^2 + 2x + 3)(x - 1)$

4. $(2x^2 + 3x + 10)(x + 2)$

5. The area of a rectangular pool is represented by the polynomial below:

$$3x^2 - 10x + 3$$

What are the dimensions (length and width) of the rectangular pool?

a. (3x + 9) (x - 1)
b. (x - 9) (x – 1)
c. (3x - 1) (x - 3)
d. (x + 10) (x + 3)

6. Which function is equivalent to $f(x) = x^2 - 2x - 15$?

a. f(x) = (x – 3) (x + 5)
b. f(x) = (x – 5) (x + 3)
c. f(x) = (3x – 1) (x +5)
d. f(x) = (x + 1) (x – 15)

Factoring-Box Method

- Label the edges of the box with the binomials
- **Write the negative and addition sign right next to the number**
- Multiply the edges to fill in the box
- Remember to use your exponent rules when MULTIPLYING only:
    - $x \cdot x = x^2$
    - $x^2 \cdot x = x^3$
    - $x^4 \cdot x^2 = x^6$
- Combine the like terms
- Rewrite the terms from biggest exponent to smallest

Example: (3x – 2)(-4x + 6)

f(x) = ______________________

Find the area of the following polynomials:

1. (x + 2) (3x – 5)

2. (-4x + 1) (3x + 1)

Parallel and Perpendicular Lines

Parallel lines have the ______________________.

Perpendicular lines have __________________________.

Examples:

$y = 6x - 3$ $y = -\frac{1}{6}x + 7$	$y = 3x + 2$ $2y = 6x - 6$	$y = 3x + 9$ $y = \frac{1}{3}x - 4$

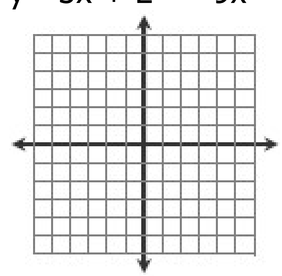
Write the slope-intercept form of an equation of the line that passes through the given point and is parallel to the graph of each equation.

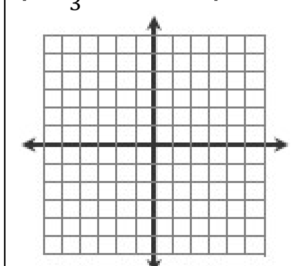
(-2, 5), y = -4x + 2	(-1, -4), 9x + 3y = 8

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

(3, 2), y = x + 5	(-6, 4), 3y = 2x – 3

y= 3x + 2 9x – 3y = -6	$y = \frac{2}{3}x - 3$ y= x + 4





Linear Transformations

When the slope of the line is ______________than 1, the line gets ___________________.

When the slope of the line is ______________than 1, the line gets ___________________.

When the y-intercept is _________________________, the line shifts/translates__________________ the parent function y=x.

When the y-intercept is _______________________, the line shifts/translates__________________ the parent function y=x.

Examples:
Describe the change that occurs when the graph of y= x is changed to y=$\frac{1}{6}x - 2$.

Describe the change that occurs when the graph of y= 2x +3 is transformed to y=$\frac{-1}{2}x$ +3.

If the slope of the function y= -3.5x + 12.8 is changed to 1.5, which of the following would best describe the graph of the new function?
A. The graph of the new function intercepts the y-axis at the same point as the original function
B. The graph of the new function intercepts the x-axis at the same point as the original function
C. The graph of the new function has a negative slope.
D. The graph of the new function has a positive x-intercept.

Arithmetic Sequences

$a_n = a_1 + d(n-1)$ a_1 = d =

Calculator Strategy: Graph// 2nd GRAPH

The expression below describes a pattern of numbers.

0.20*m* + 4.50

If *m* represents the number's position in the sequence, which pattern of numbers does the expression describe?

A 4.60, 4.70, 4.80, 4.90, 5.00 . . .
B 6.50, 8.50, 10.50, 12.50, 14.50. . .
C 4.70, 4.90, 5.10, 5.30, 5.50. . .
D 4.52, 5.54, 4.56, 4.58, 4.60. . .

The following table describes an arithmetic sequence, where *n* represents a number's position in the sequence.

n	1	5	8
$2(n+3)$	8	16	?

What is the missing value in the table?

A 17
B 22
C 24
D 32

The first five figures in a pattern are shown below. Each figure is made up of identical circles.

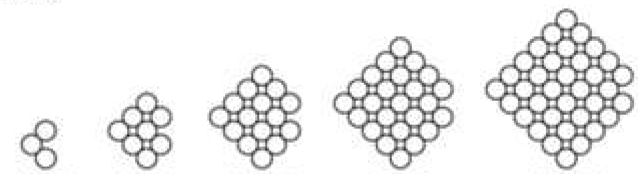


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

If the pattern continues, which expression can be used to find the number of circles that make up Figure n?

A $n^2 + 2n$ **B** $n^2 + 2$ **C** $2n^2 + 1$ **D** $2n^2 + n$

A sequence is represented below.

{–20, –5, 10, 25, 40, ...}

Which representation is not a formula for the nth term of the sequence?

A $f(x) = -20 + 15(x - 1)$ **B** $t_n = -20 + (n - 1)15$
C $y = 15x - 20$ **D** $y = 15x - 35$

Radicals

Summarize each step:

Simplify $\sqrt{27}$

$= \sqrt{3 \bullet 3 \bullet 3}$

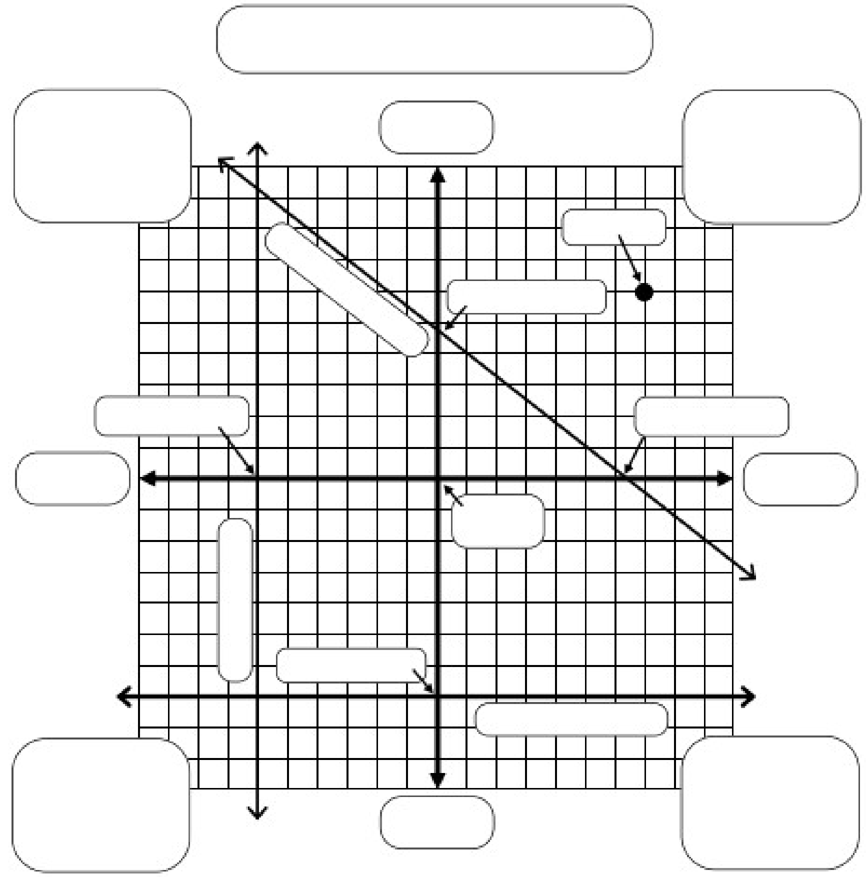
$= \sqrt{(3 \bullet 3) \bullet 3}$

$= 3\sqrt{3}$

Practice: Simplify each radical expression.

1. $\sqrt{180}$	2. $\sqrt{18}$	3. $\sqrt{112}$
4. $2\sqrt{72}$	5. $6\sqrt{75}$	6. $7\sqrt{52}$
7. $\sqrt{5} \cdot \sqrt{10}$	8. $\sqrt{15} \cdot \sqrt{10}$	9. $3\sqrt{12} \cdot \sqrt{6}$

Linear Functions Vocabulary



VOCABULARY

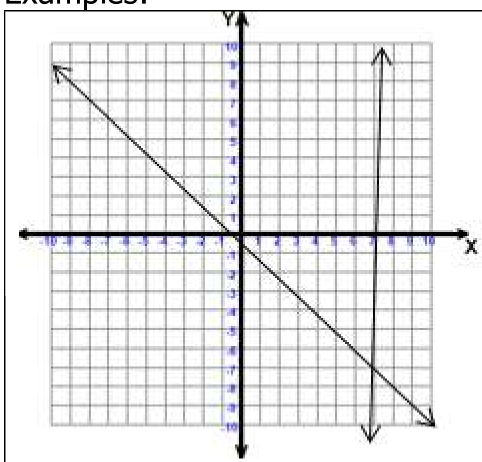
coordinate plane
coordinates
diagonal line
horizontal line
ordered pair
origin
point
quadrant
vertical line
x-axis
y-axis
x-coordinate
y-coordinate
x-intercept
y-intercept

System of Linear Equations

A solution to a system of equations if where the ______________________________, written as an _________________.

One Solution:	No Solution:	Infinite Solutions:

Examples:



$$-8x - 10y = 24$$
$$6x + 5y = 2$$

x	Y_1	Y_2
-2	2	3
-1	5	8
0	-1	3
4	1	1
5	9	-2

Calculator Strategies:

To find the solution from a graph:
2nd TRACE
5: intersect
Enter Enter Enter

Properties of Exponents Practice

Simplify the following expressions:

1. $(2x^2)(4x^3y^2)$

2. $\dfrac{21d^{18}e^5}{7d^{11}e^3}$

3. $(x^2)^3$

4. $x^{2/3}$

5. x^{-4}

6. $(14a^4b^6)^2(a^6c^3)^7$

7. $\dfrac{2y^3 \cdot 3xy^3}{3x^2y^4}$

8. $(2x^4y^{-3})^{-4}$

9. $\dfrac{(2x^3z^2)^3}{x^3y^4z^2 \cdot x^{-4}z^3}$

Properties of Exponents

These properties are on your STAAR Chart:

PROPERTIES OF EXPONENTS	
Product of powers	$a^m a^n = a^{(m+n)}$
Quotient of powers	$\frac{a^m}{a^n} = a^{(m-n)}$
Power of a power	$(a^m)^n = a^{mn}$
Rational exponent	$a^{\frac{m}{n}} = \sqrt[n]{a^m}$
Negative exponent	$a^{-n} = \frac{1}{a^n}$

Examples: Name the property that needs to be used for each problem. (There can be more than one!)

1. $(2x^2)(4x^3y^2)$

2. $\frac{21d^{18}e^5}{7d^{11}e^3}$

3. $(x^2)^3$

4. $x^{2/3}$

5. x^{-4}

6. $(14a^4b^6)^2(a^6c^3)^7$

7. $\frac{2y^3 \cdot 3xy^3}{3x^2y^4}$

8. $(2x^4y^{-3})^{-4}$

9. $\frac{(2x^3z^2)^3}{x^3y^4z^2 \cdot x^{-4}z^3}$

System Word Problems

A television weighs 50 pounds and a microwave weighs 30 pounds. A TV occupies 4 cubic feet and microwave occupies 3 cubic feet. A truck is carrying 1500 pounds of cargo that occupies 138 cubic feet of space. Which system of equations can be used to find the total number of televisions, t, and microwaves, m, that are in the truck?

A) 50t + 30m = 138
   4t + 3m = 1500

B) 50t + 4m = 1500
   30t + 3m = 138

C) 50 + 4t = 1500
   30 + 3m = 138

D) 50t + 30m = 1500
   4t + 3m = 138

E) None of the above

Tickets for a movie cost $5 for adults and $2 for students. One afternoon 21 tickets were sold and the receipts totaled $72. How many children tickets were bought?

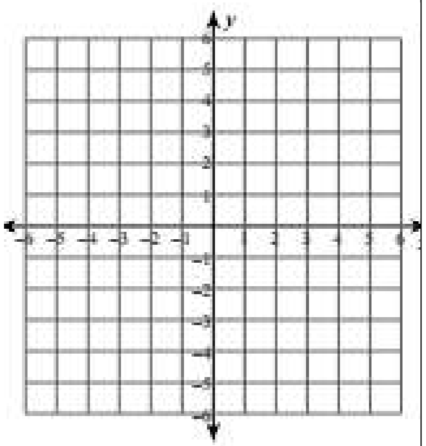
The perimeter of a rectangle is 89 cm. The length is 8 cm more than the width. What is the length of the rectangle?

You and your cousin go to Wendy's for a "big" lunch. You buy 3 burgers and 2 orders of fries for $6.50. You cousin buys 2 burgers and 5 orders of fries for $8.00. How much did each item cost?

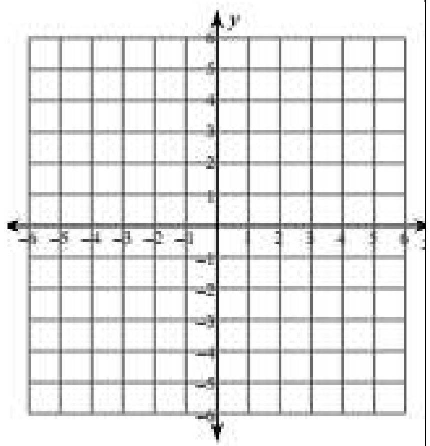
Linear Inequality

A solution is an ____________________ inside the ____________________ or on a __________________.

Linear Inequality:
$y \geq -\frac{1}{3}x + 3$



Linear Inequality:
$5x + y \geq 3$



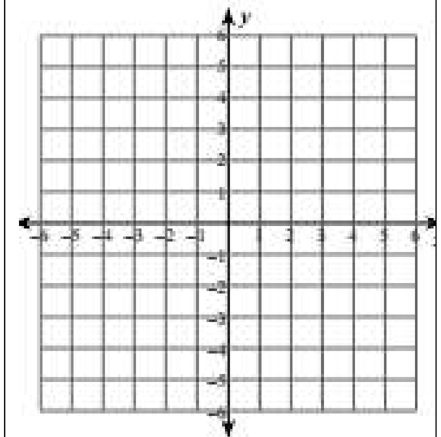
Inequalities (Substitution):

$2x - 3y \leq 7$; (5, -4)

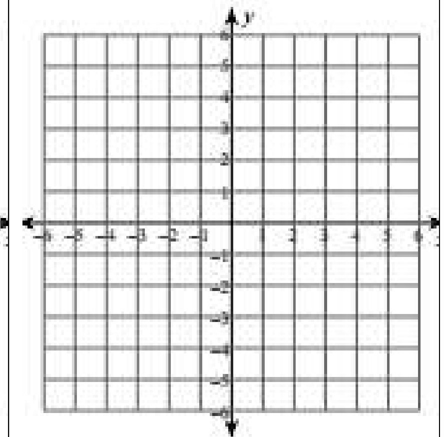
$-x - y > 5$; (-2, -4)

Linear Inequality Practice

$x - 2y \geq -8$
Is the point (-3, 5) in the solution?



$4x + 3y > -6$
Is the point (0, 3) in the solution?



$3x + 4y < 20$
Is the point (1, –5) in the solution?

$y \geq -3x - 3$
Is the point (4, 3) in the solution?

Four times a number plus 12 is greater than twenty minus 8.