

ALGEBRA 1 PLAN FOR March 17th – April 24th

Name _____

Please review the following and complete before returning on April 27th. These will be turned into your teacher and graded when you return.

Hello Parents, Guardians and Students,

We are in a unique situation during these next 6 weeks. The following packet will cover essential concepts and standards that have already been taught this year that are necessary for success in future math classes and for the material we will cover when we return to school. Please complete the following packet of Semester 1 material during the next six weeks. Each page has one problem worked out on it to help remind you of the process. If you need more help please look at the website given below that includes informational videos and quizzes to practice. You will also need to complete the Semester 2 (Polynomials and Quadratics Review Packet) to help be successful with finishing the semester strong and allowing us to pick up where we left off when we return. If you are currently failing second semester algebra, then you will need the Semester 2 packet completed in order to retake a test when you return to school. Use this time to study and to review any concepts needed and set yourself up to be successful the rest of this year and in the future. If you missed the test on March 13th you will need to do that when you return in April.

The following website is helpful for studying and reviewing topics.

<https://www.khanacademy.org/math/algebra>

Kahn Academy has informational videos and practice quizzes to practice or review various algebra topics. The following sections would be helpful for students to review and might be helpful when working on the Semester 1 or Semester 2 material.

- Algebra Foundations
- Solving Equations and Inequalities
- Linear equations and graphs
- Forms of linear equations
- Systems of equations
- Functions
- Quadratics: Multiplying and Factoring

If you have any questions or need to contact your Algebra I teacher.

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SEMESTER 1 REVIEW

Name:

Date:

HW #1

Lesson 1 Order of Operations

Objective: Evaluate each expression if $a = 2$, $b = -3$, $c = 4$, and $d = 5$.

1	$ab - cd$ $(2)(-3) - (4)(5)$ $-6 - 20$ -26	2	$2a + bc^2 - d$	3	$\frac{2b(c - a)}{c + 3}$
4	$a + b^2 + c^2$	5	$a^3d + 2(b - c)$	6	$3(bc - 4ad)$
7	$2ab - c + d$	8	$2(a + b) - c^2$	9	$\frac{3c(2d - b)}{ac}$
10	$3a + 2 - b^2$	11	$a^3d + 2bc$	12	$-4[b^2 + (c - 2)^3]$

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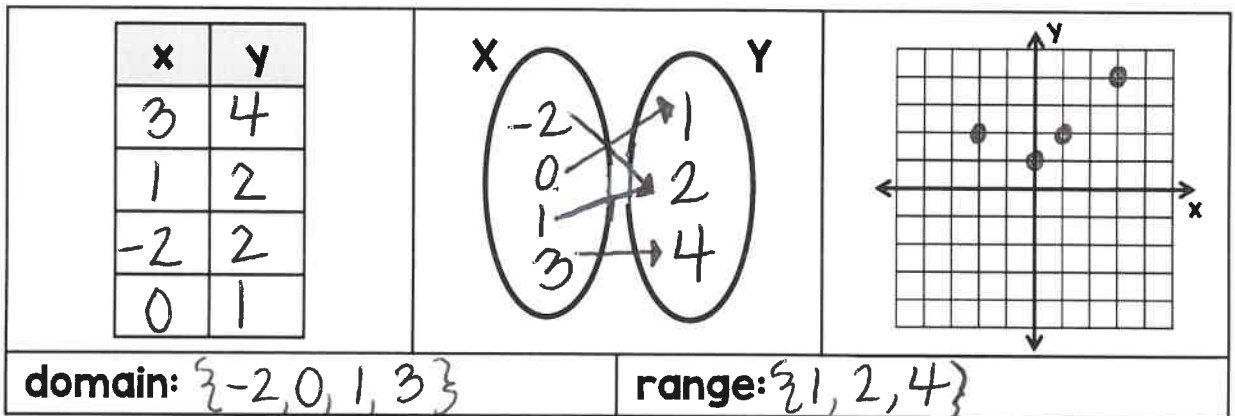
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HW # 2

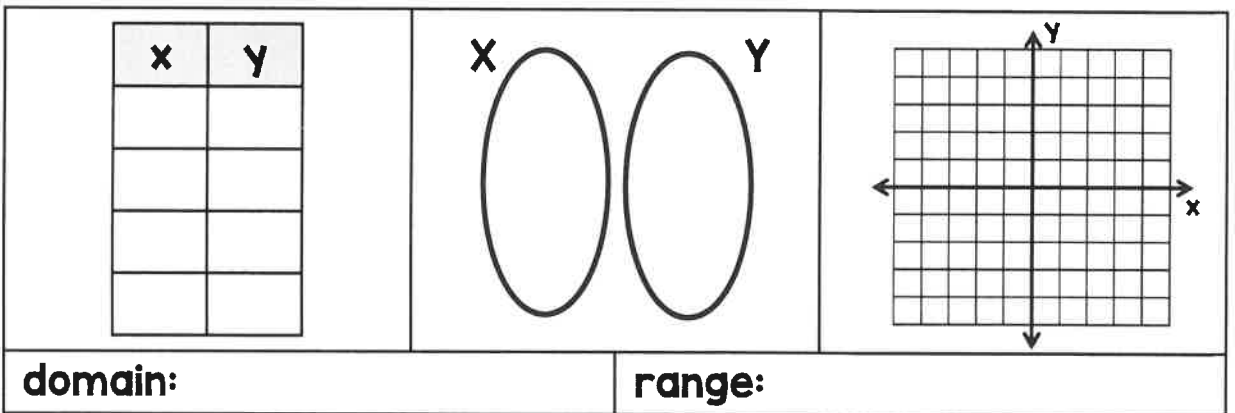
Lesson 2 Relations

Objective: Display relations as tables, mappings, and graphs.
List the domain and the range.

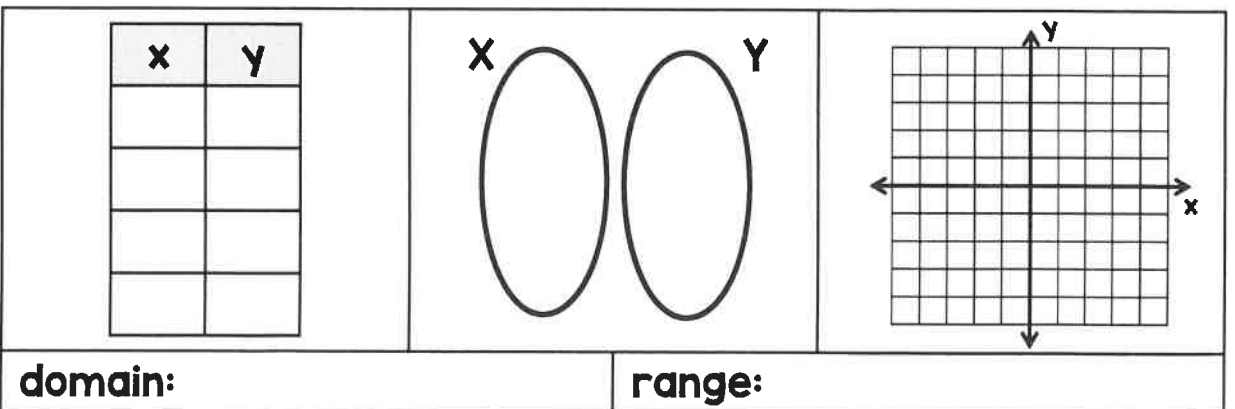
1 $\{(3, 4), (1, 2), (-2, 2), (0, 1)\}$



2 $\{(3, -2), (-1, 0), (-3, 1), (-2, 0)\}$



3 $\{(2, 2), (0, 2), (-4, 3), (-4, 2)\}$



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HW# 3

Lesson 3 Solving Equations

Objective: Solve each equation.

<p>1</p> $\frac{-x+1}{1-1} = -1$ $\frac{-x}{-1} = \frac{-2}{-1}$ $x = 2$	<p>2</p> $\frac{x}{4} = -5$	<p>3</p> $5x = 4x - 1$
<p>4</p> $8x + x = 0$	<p>5</p> $5 + m = m + 5$	<p>6</p> $3 = 4p - 1$
<p>7</p> $9m + 9 = 10(m-1)$	<p>8</p> $2(r + 8) = 2$	<p>9</p> $2x = -8 + x$

< less than

> greater than

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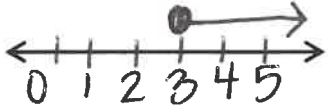




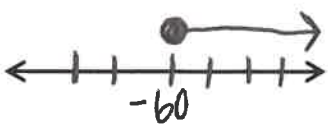
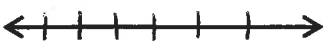
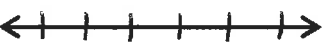

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HW# 4

Lesson 4 Solving Multi-Step Inequalities

Objective: Solve each multi-step inequality, and graph the solution.

remember if you mult. or divide by - flip the sign

<p>1</p> $\frac{-6m \cdot 12 \leq -6}{-12 \quad -12}$ $\frac{-6m \leq -18}{-6 \quad -6}$ $m \geq 3$ 	<p>2</p> $-4 - 8x > 60$ 	<p>3</p> $-2 + \frac{n}{3} < 10$ 
<p>4</p> $7m + 2m - 1 > 26$ 	<p>5</p> $4x + 1 - 5x \leq 10$ 	<p>6</p> $\frac{11 + \frac{n}{3} \geq -9}{-11 \quad -11}$ $\frac{n}{3} \geq -20 \cdot 3$ $n \geq -60$ 
<p>7</p> $\frac{2x - 3}{4} - 4 < -3$ 	<p>8</p> $5(2y - 6) + 3 > 9$ 	<p>9</p> $3x + 4 > 2(x + 3) + 4$ 

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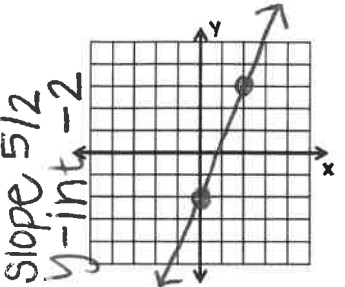
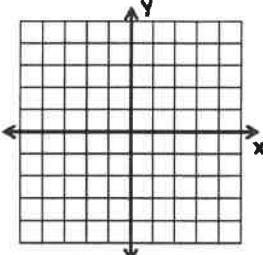
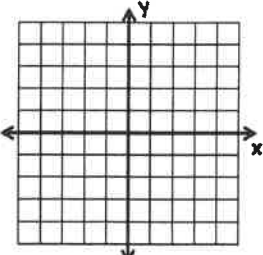
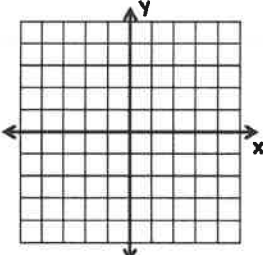
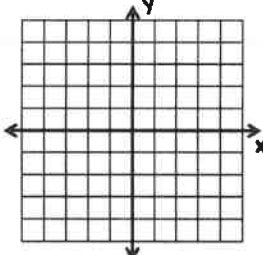
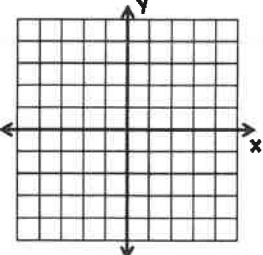
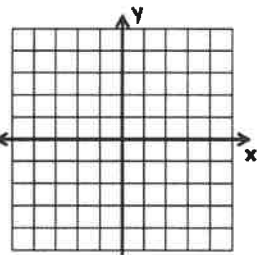
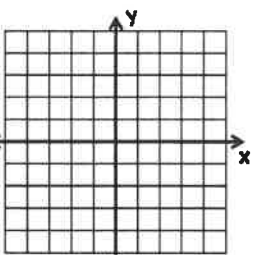
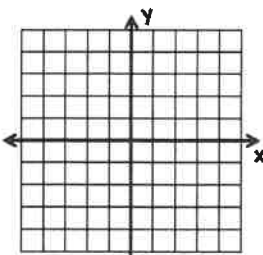
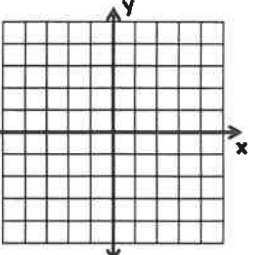
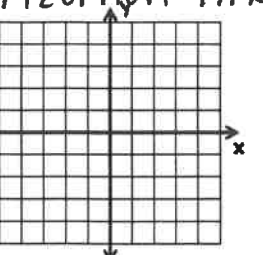
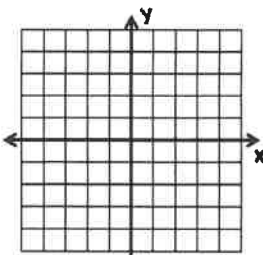
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HW # 5

Lesson 5 Graphing Equations in Slope-Int Form

Objective: Sketch the graph of each line.

$y = mx + b$ $m = \text{slope}$
 $b = y\text{-int}$

<p>1 $y = \frac{5}{2}x - 2$</p> <p>slope $\frac{5}{2}$ y-int -2</p> 	<p>2 $y = -2x + 1$</p> 	<p>3 $y = -\frac{1}{2}x - 3$</p> 
<p>4 $y = \frac{2}{3}x - 4$</p> 	<p>5 $y = 3x + 2$</p> 	<p>6 $y = 4$ Horizontal line</p> 
<p>7 $y = -4x + 5$</p> 	<p>8 $y = \frac{1}{3}x$</p> 	<p>9 $y = -\frac{3}{4}x$</p> 
<p>10 $y = -x - 4$</p> 	<p>11 $y = -3$ Horizontal line</p> 	<p>12 $y = x + 1$</p> 

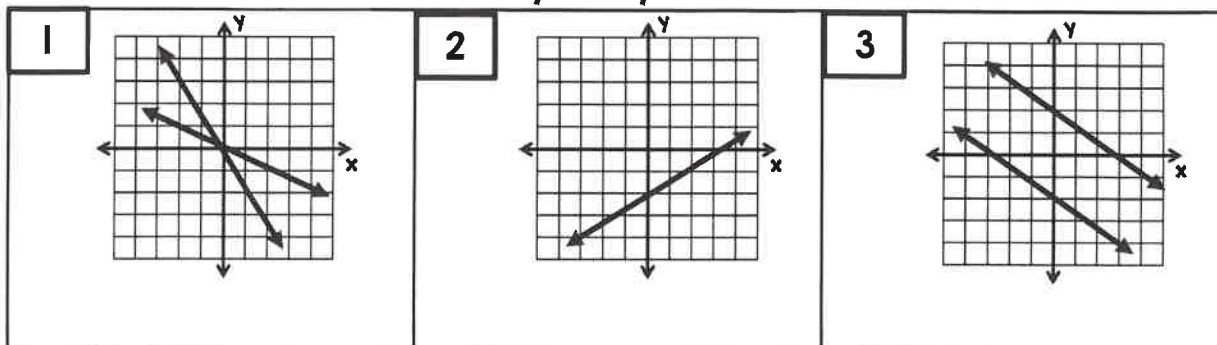
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HW # 6

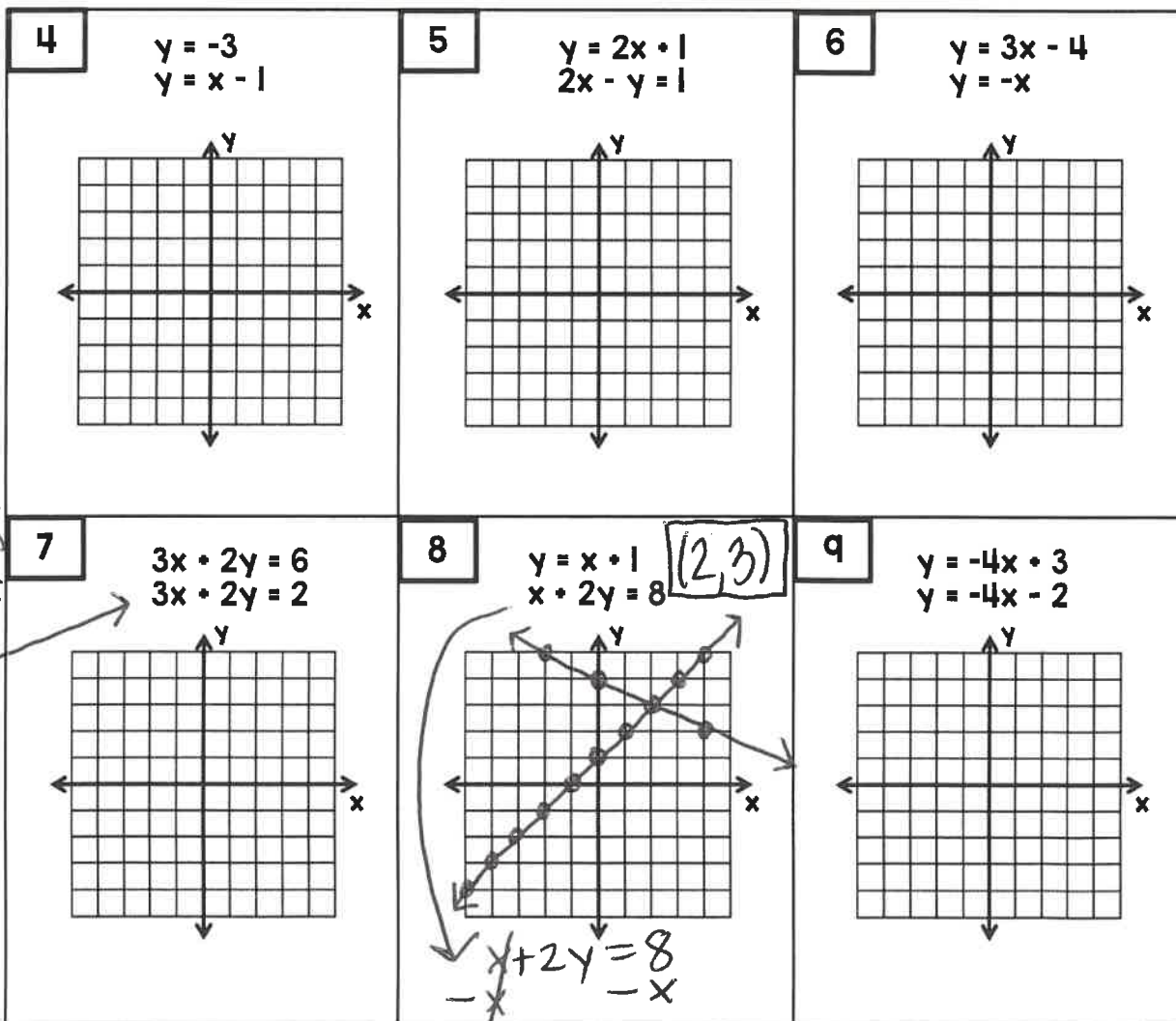
Lesson 6 Graphing Systems of Equations

Objective: Determine whether each system has no solution, one solution or infinitely many solutions.



Objective: a. Graph each System.

b. Determine number of solutions. If one solution, name it.



rewrite into $y = mx + b$ first

$$\begin{aligned} y &= x + 1 \\ x + 2y &= 8 \end{aligned} \quad (2, 3)$$

$$\begin{aligned} x + 2y &= 8 \\ -x & \quad \quad \quad \end{aligned}$$

$$\frac{2y}{2} = \frac{-x + 8}{2} \quad y = -\frac{1}{2}x + 4$$

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HW # 7

Lesson 7 Solving Systems: Substitution or Elimination

Objective: Use Substitution (#1-3) or elimination(#4-6) to solve each system of equations.

Substitution	1	$\begin{aligned} y &= 4x \\ 3x + 2y &= 55 \end{aligned}$ $3x + 2(4x) = 55$ $3x + 8x = 55$ $\frac{11x}{11} = \frac{55}{11}$ $x = 5$ $y = 4(5)$ $y = 20$ $(5, 20)$	2	$\begin{aligned} x &= 2y - 7 \\ 4x + y &= 71 \end{aligned}$	3	$\begin{aligned} x &= y + 8 \\ x &= 5y + 12 \end{aligned}$
	Elimination	4	$\begin{aligned} 4x + 3y &= 20 \\ + 4x - 3y &= 12 \\ \hline 8x &= 32 \\ \frac{8x}{8} &= \frac{32}{8} \\ x &= 4 \end{aligned}$ $4(4) + 3y = 20$ $\frac{16}{-16} + 3y = \frac{20}{-16}$ $\frac{3y}{3} = \frac{4}{3} \quad y = 4/3$ $(4, 4/3)$	5	$\begin{aligned} x + y &= -5 \\ x - y &= -7 \end{aligned}$	6
7		<p>Tickets to the local carnival cost \$5.50 for adults and \$3.00 for children under the age of 12. A group of 8 people bought tickets to the carnival for \$36.50. Write a system of equations to represent this scenario. How many adult tickets were sold?</p> <p>x = # of adult tickets y = # of child tickets</p>				

2nd Semester Review Packet

Unit 7: Polynomials and Factoring

Naming Polynomials	
Degree <small>(largest exponent)</small>	Name
0	constant
1	Linear
2	Quadratic
3	cubic
$n \geq 4$	n^{th} degree <small>(5th degree, 10th degree, etc.)</small>

# of Terms	Name
1	monomial
2	binomial
3	trinomial
$n \geq 4$	Polynomial

Unit 8: Quadratic Forms and Key Features

Standard Form

$$y = ax^2 + bx + c$$

Vertex Form

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

Factored Form

$$y = a(x - r_1)(x - r_2)$$

? TOPIC ESSENTIAL QUESTION

1. How do you work with polynomials to rewrite expressions and solve problems?

**** Read instructions carefully. Show all work in the space provided. ****

1. Name the following polynomials:

a) $2x^2 + 7x$

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

c) $-4x$

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

2. Write an example of each of the following:

a) **quadratic trinomial**b) **cubic monomial**c) **linear binomial**d) **5th degree monomial**

3. Simplify the polynomials below. Write your final answer in **standard form**.

a) $-2x^3 - 4x + 2 - x^2 + 6 + 10x + 3x^3$

c) $(2x^2 + 5x - 5) - (-3x^2 + 8)$

b) $(4b^4 - 3 + b^2) + (5b^2 - 4 + 7b^4)$

d) $(-x^2 - 5x + 8) - (6x - 9)$

4. Simplify each of the polynomials below. Write your final answer in **standard form**.

a) $6x(x - 3)$

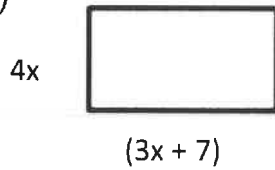
b) $(x + 2)(x - 8)$

c) $(x - 4)(x + 4)$

d) $(x + 3)^2$

5. Find the *area* and *perimeter* of the rectangle below.

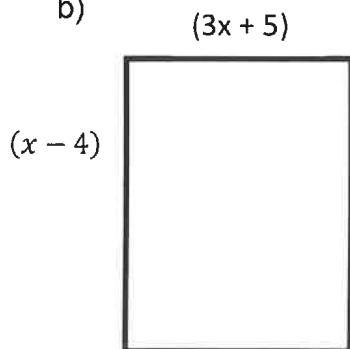
a)



Area: _____

Perimeter: _____

b)



Area: _____

Perimeter: _____

6. Rewrite each of the polynomials below into **factored form**.

a) $4x^2 - 12$

Check your work here:



b) $x^2 - 14x + 49$

Check your work here:



c) $x^2 - 6x - 27$

Check your work here:



d) $x^2 + 6x - 16$

Check your work here:



e) $x^2 - 25$

Check your work here:



f) $-x^2 - 7x + 30$

Check your work here:



g) $3x^2 + 15x + 12$

Check your work here:



h) $6x^2 + 30x + 36$

Check your work here:



1. How can you use sketches and equations of quadratic functions to model situations and make predictions?

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Date: _____

Equations and Formulas!!

Standard Form

$$f(x) = ax^2 + bx + c$$

Axis of Symmetry Formula:

$$x = -\frac{b}{2a}$$

y-intercept: $(0, c)$

Vertex Form

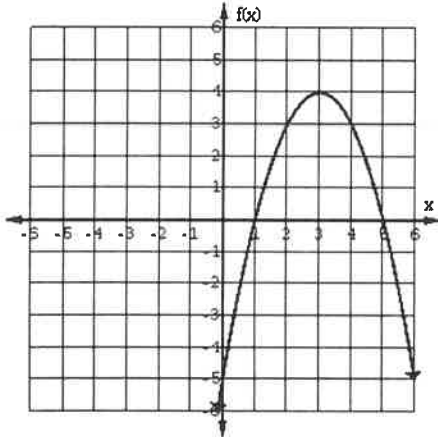
$$f(x) = a(x - h)^2 + k$$

vertex: (h, k)

Factored Form

$$f(x) = a(x - r_1)(x - r_2)$$

1. Identify the following using the quadratic function graphed below.



y-intercept: _____

x-intercept(s): _____

Vertex: _____

Axis of Symmetry: _____

Concavity: _____

Max or Min? _____

Domain: _____

Range: _____

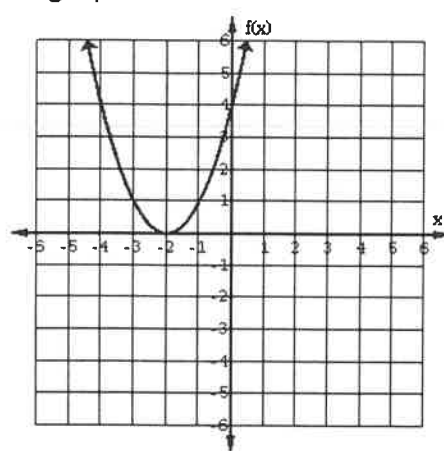
The function is increasing on the _____.

The function is decreasing on the _____.

Write an equation in **vertex form** to represent the graph above.

$f(x) =$ _____

2. Identify the following using the quadratic function graphed below.



y-intercept: _____

x-intercept(s): _____

Vertex: _____

Axis of Symmetry: _____

Concavity: _____

Max or Min? _____

Domain: _____

Range: _____

The function is increasing on the _____.

The function is decreasing on the _____.

Write an equation in **vertex form** to represent the graph above.

$f(x) =$ _____

3. Identify the following using the function provided.

$$f(x) = -(x + 2)^2 + 10$$

Concavity: _____

Max or Min? _____

y-intercept: _____

Vertex: _____

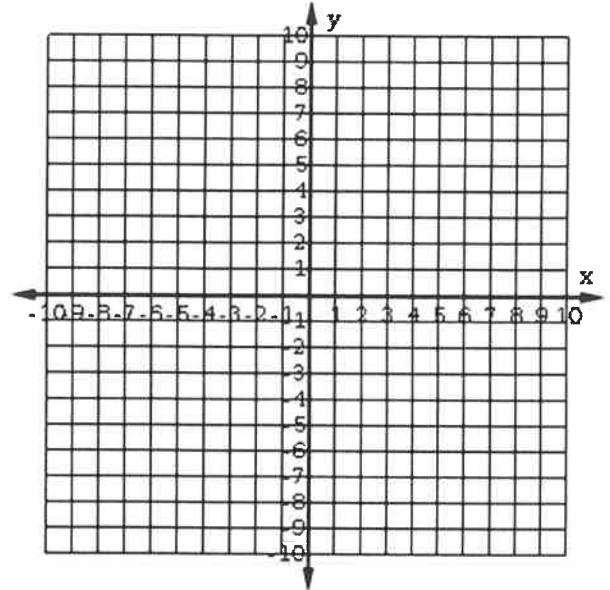
Axis of Symmetry: _____

Domain: _____

Range: _____

Show your work here:

Sketch the parabola on the grid below.



4. Identify the following using the function provided.

$$f(x) = 3(x - 1)^2 - 5$$

Concavity: _____

Max or Min? _____

y-intercept: _____

Vertex: _____

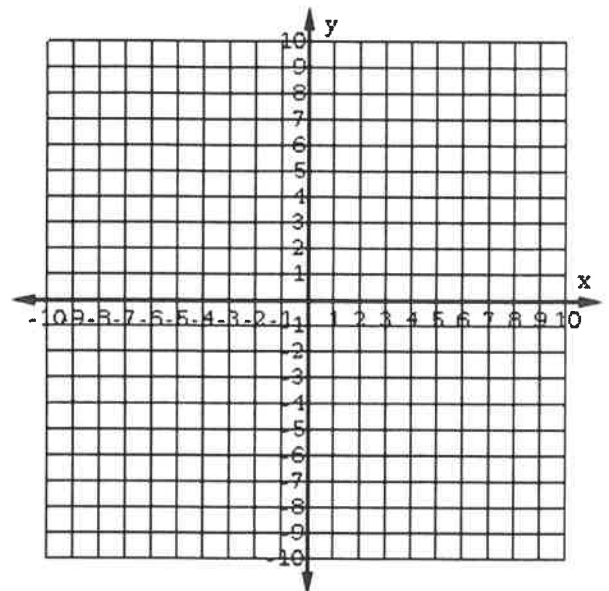
Axis of Symmetry: _____

Domain: _____

Range: _____

Show your work here:

Sketch the parabola on the grid below.



5. Identify the following using the function provided.

$$f(x) = -2x^2 - 8x + 1$$

Axis of Symmetry: _____

Vertex: _____

Concavity: _____

Max or Min? _____ Max or Min Value: _____

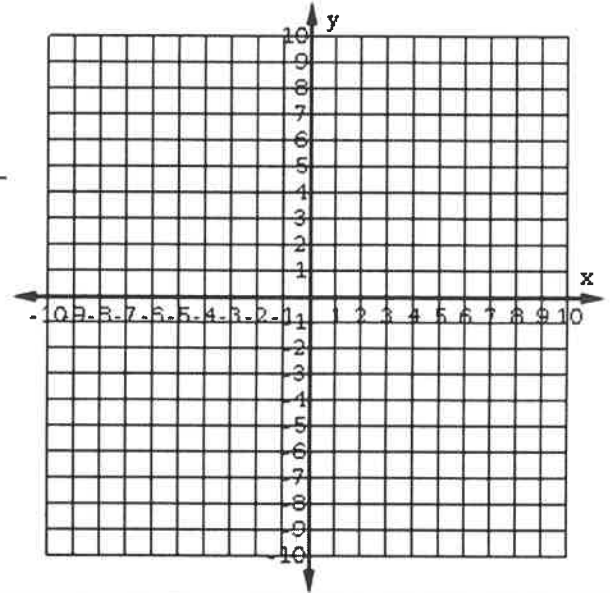
Domain: _____

Range: _____

y-intercept: _____

Show your work here:

Sketch the parabola on the grid below.



6. Identify the following using the function provided. Show your work.

$$f(x) = x^2 + 4x - 1$$

Axis of Symmetry: _____

Vertex: _____

Concavity: _____

Max or Min? _____ Max or Min Value: _____

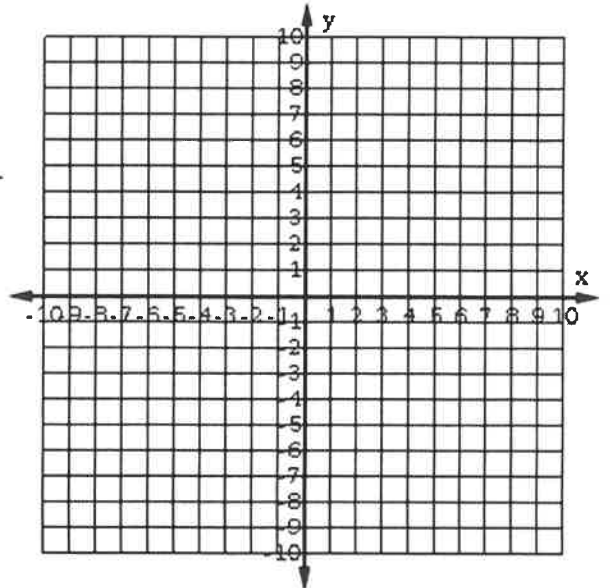
Domain: _____

Range: _____

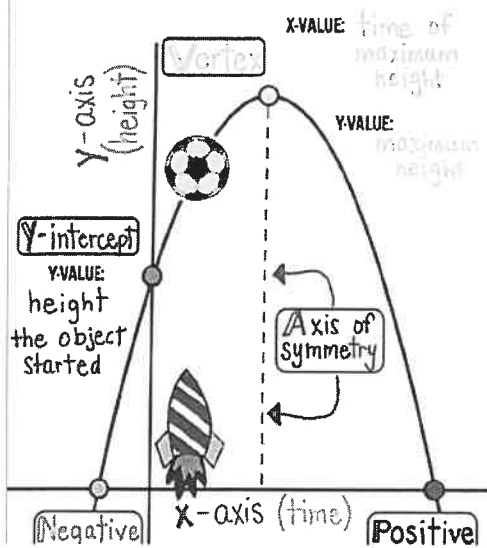
y-intercept: _____

Show your work here:

Sketch the parabola on the grid below.



QUADRATIC GRAPHS



7. When Jordan dives off a diving board, the equation of his pathway can be modeled by $f(x) = -16x^2 + 15x + 12$.

a. How long will it take for Jordan reach his maximum height?

b. What will be the maximum height of Joey's dive?

c. What was Joey's starting height on the diving board?

8. At the end of the school year, Rachel threw her Algebra textbook off the top of a 12-story building. The equation of the pathway of her book is $f(x) = -16x^2 + 36x + 160$.

a. How many seconds after being thrown does the book reach its maximum height?

b. What was the book's starting height?

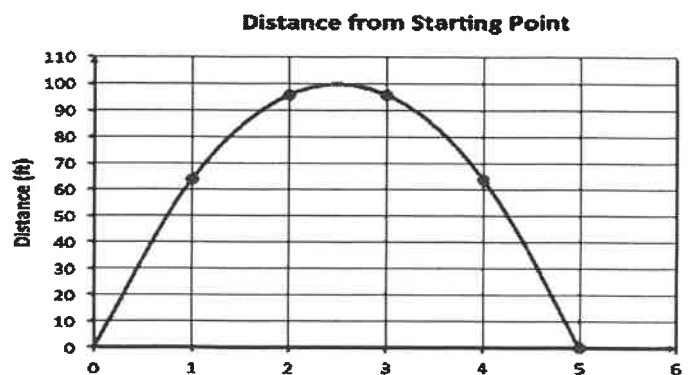
c. What is the maximum height that the book will reach?

9. The graph represents the height of a rocket over a period of time after is has been launched. Use the graph to answer the following questions. Include units with your responses.

a) How long did it take for the rocket to reach its maximum height?

b) What was the rocket's starting height?

c) What was the maximum height of the rocket?



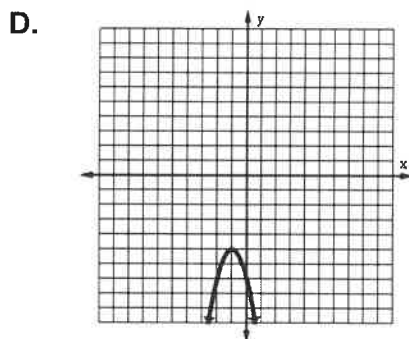
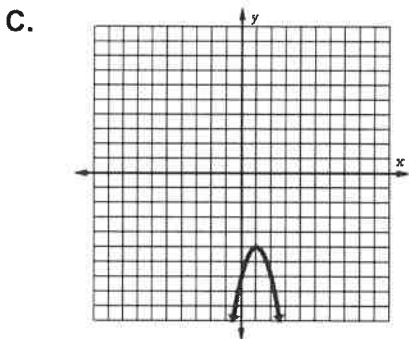
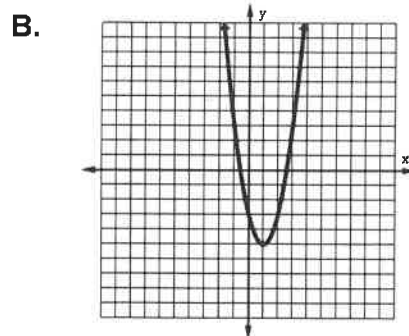
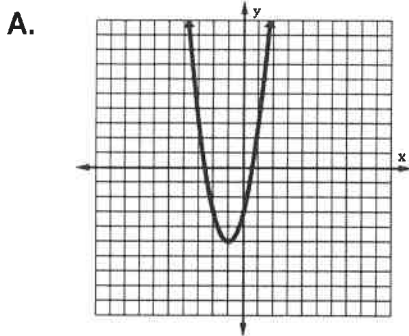
Matching: Write the letter for the graph that correctly represents each quadratic function below.

10. _____ $y = 2(x + 1)^2 - 5$

11. _____ $y = -2(x + 1)^2 - 5$

12. _____ $y = 2(x - 1)^2 - 5$

13. _____ $y = -2(x - 1)^2 - 5$



14. Describe the transformations from the parent function $f(x) = x^2$ to $g(x) = (x - 5)^2 + 1$.

15. Describe the transformations from the parent function $f(x) = x^2$ to $h(x) = -(x + 5)^2$.

16. Describe the transformations from the parent function $f(x) = x^2$ to $k(x) = -2(x + 4)^2 - 3$.

17. Write the equation in **vertex form** to show the transformation from $f(x) = x^2$ into $p(x)$ based on the descriptions below.

- compressed vertically by a factor of $\frac{1}{3}$,
- translated left 4 units,
- translated right 5 units

$$p(x) = \underline{\hspace{10em}}$$

18. Write the equation in **vertex form** to show the transformation from $f(x) = x^2$ into $g(x)$ based on the descriptions below.

- translated right 1 unit,
- reflected over the x -axis,
- compressed vertically by a factor of $\frac{1}{3}$

$$g(x) = \underline{\hspace{10em}}$$

19. Write the equation in **vertex form** to show the transformation from $f(x) = x^2$ into $h(x)$ based on the descriptions below.

- reflected over the x -axis,
- stretched vertically by a factor of 4
- translated up 7 units, and
- translated left 2 units

$$h(x) = \underline{\hspace{10em}}$$

Rewriting Equations:

20. Rewrite into Standard Form:

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

21. Rewrite into Standard Form:

$$y = (x + 4)^2 - 10$$

22. Rewrite into Factored Form:

$$y = x^2 - 5x - 24$$

23. Rewrite into Factored Form:

$$y = x^2 + 6x + 8$$