

Midterm Review

1. Discriminant: $b^2 - 4ac$. List the number and type of solutions for each.

Positive Discriminant:	Negative Discriminant:	Zero Discriminant:

2. What are the x-intercepts of each of the following functions?

a. $y = x^2 + 3x - 10$	b. $y = 2x - 10$	c. $y = -x^2 - 4$

3. Describe the end behavior of each of the functions. Rises/Falls to the left, Rises/Falls to the right.

a. $y = -x^6 + 5x - 4$	b. $y = x^9 + x^3 - x^2 + 1$	c. $y = -x^7 - x^4 + 2x^2 + 1$

4. Is $(x-4)$ a binomial factor to the following functions? Try factoring each expression.

a. $y = x^2 + x - 12$	b. $y = x^2 + x - 20$	c. $y = 2x^2 - 5x - 12$

5. Factor the following expressions completely.

a. $8x^2 - 16x - 24$	b. $-4x^2 - 6x$	c. $6x^2 - 15x - 8x + 20$
d. $2x^3 - 8x^2 - 64x$	e. $x^2 - 17x + 72$	f. $10x^2 - 4x + 15x - 6$

6. Fill in the missing factors.					
Item Bank					
$(x^2 - 3x - 1)$	$(3x + 2)$	$(x - 3)$	$(2x - 3)$	$(x + 6)$	$(3x - 1)$
a. $-2x^2 + 2x + 12 = -2(x + 2)$ _____			b. $3x^2 - 13x - 10 = (x - 5)$ _____		
c. $12x^2 - 10x + 2 = 2(2x - 1)$ _____			d. $2x^3 - 6x^2 - 2x = 2x$ _____		
e. $3x^2 + 6x - 72 = 3(x - 4)$ _____			f. $6x^2 - 13x + 6 = (3x - 2)$ _____		

7. Simplify the following.		
a. $(-2 - 4i) - (-5 + 7i)$	b. $(-2 - 4i) + (-5 + 7i)$	c. $(-2 - 4i)(-5 + 7i)$

8. Use the quadratic formula to solve.	
a. $x^2 + 4x + 5 = 0$	b. $2x^2 - 6x + 5 = 0$

9. Simplify.			
a. $\sqrt{-24}$	b. $\sqrt{-18}$	c. $2\sqrt{-72}$	$-2\sqrt{50}$

10. Solve the following.	
a. $2x^3 + 3x^2 - 8x - 12 = 0$	b. $3x^3 + 2x^2 - 75x - 50 = 0$
c. $2x^3 - 5x^2 - 2x + 5 = 0$	d. $3x^3 + 2x^2 - 27x - 18 = 0$

11. Solve each equation by taking the square root.			
a. $10x^2 - 10 = 630$	b. $3x^2 + 4 = 130$	c. $6x^2 + 1 = 121$	d. $-10 - 3x^2 = -310$

12. Solve each equation by factoring.		
a. $x^2 - 8x + 15 = 0$	b. $x^2 - 8x + 7 = 0$	c. $x^2 - 12x + 32 = 0$
d. $x^2 + 2x = 0$	e. $10x^2 + 11x - 6 = 0$	f. $6x^2 - 23x + 20 = 0$

13. Solve each equation with the quadratic formula.	
a. $6x^2 + 8x - 25 = -3$	b. $8x^2 + 11x - 1 = 6$
c. $4x^2 - 9x - 18 = 6$	d. $10x^2 - 11x - 15 = -8$

Name: _____ Class: _____ Date: _____

ID: A

Linear, Quadratic, and Exponential Functions

Based on the difference or common ratio in y-values, identify the data as linear, quadratic, exponential, or neither. Justify your answer.

1.

x	-3	-2	-1	0	1	2	3
y	1/2	1	2	4	8	16	32

FUNCTION: _____

Justification: _____

2.

x	-3	-2	-1	0	1	2	3
y	-16	-13	-10	-7	-4	-1	2

FUNCTION: _____

Justification: _____

3.

x	-3	-2	-1	0	1	2	3
y	-18	-6	-2	0	2	6	18

FUNCTION: _____

Justification: _____

4.

x	-3	-2	-1	0	1	2	3
y	1/27	1/9	1/3	1	3	9	27

FUNCTION: _____

Justification: _____

5.

x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

FUNCTION: _____

Justification: _____

Name: _____

ID: A

6.

x	-3	-2	-1	0	1	2	3
y	-27	-9	-3	0	3	9	27

FUNCTION: _____

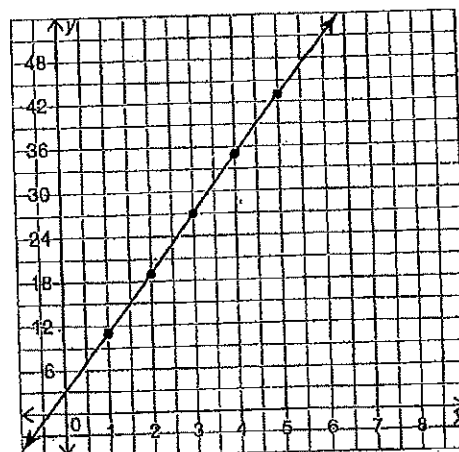
Justification: _____

Determine whether the functions are equivalent.

7.

INPUT	OUTPUT
1	11
2	19
3	27
4	35
5	43

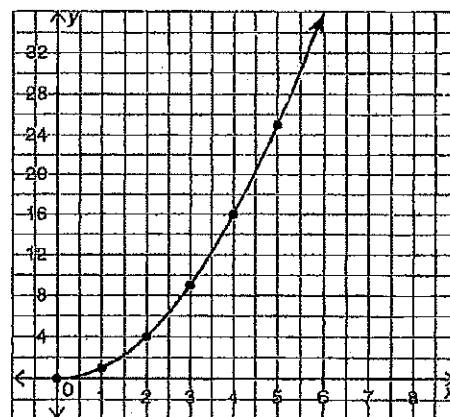
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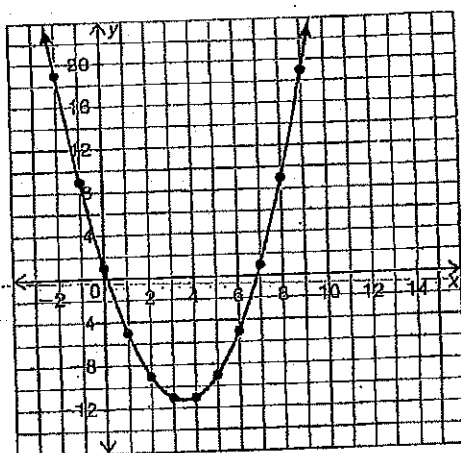
8.

INPUT	OUTPUT
1	1
2	4
3	9
4	16
5	25

8)



9. $y = x^2 - 7x + 1$



Chapter 2 Review for Mid-Term

Find the Vertex, Axis of Symmetry, Max/Min of each of the following.		
Standard Form $y = ax^2 + bx + c$	Vertex Form $y = a(x - h)^2 + k$	Factored Form $y = a(x - r_1)(x - r_2)$
1. $f(x) = -3x^2 - 6x + 5$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ y-intercept _____	2. $f(x) = 2(x - 3)^2 + 4$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____	3. $f(x) = -(x + 3)(x - 5)$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ Roots _____
4. $f(x) = 2x^2 - 12x - 7$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ y-intercept _____	5. $f(x) = -\frac{1}{2}(x + 2)^2 - 5$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____	6. $f(x) = -3(x - 4)(x - 2)$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ Roots _____
7. $f(x) = -x^2 + 6x - 1$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ y-intercept _____	8. $f(x) = -3(x - 2)^2 - 4$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____	9. $f(x) = 2(x + 5)(x + 3)$ Vertex: _____ Axis of Symmetry: _____ Concave up/down: _____ Minimum/Maximum _____ Roots _____

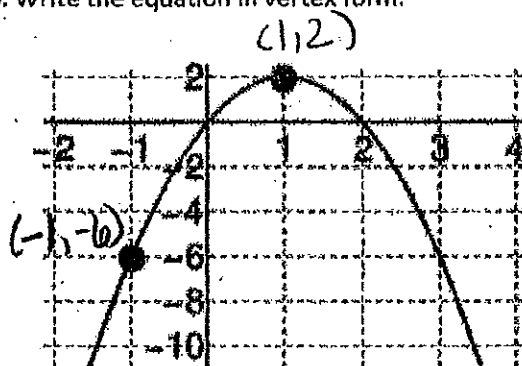
Convert the following to standard form.	
10. $f(x) = 2(x - 4)(x + 1)$	11. $f(x) = -(x - 6)^2 + 4$
12. $f(x) = -2(3x + 1)(2x - 1)$	13. $f(x) = 2(x + 1)^2 - 3$

Write a quadratic equation given the following information. Must Show All Work!!!

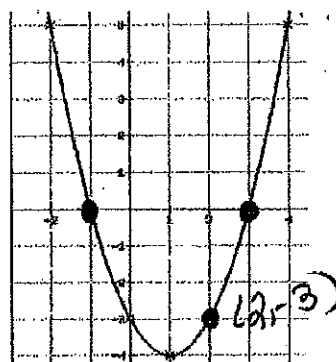
14. Given the vertex $(-2, -9)$ and a point $(1, 0)$.

15. Given the roots are $(-6, 0)$ and $(4, 0)$ and a point $(2, -3)$.

16. Write the equation in vertex form.



17. Write the equation in factored form.



18. Simplify the following.

a. $(-2 - 4i) - (-5 + 7i)$

b. $(-2 - 4i) + (-5 + 7i)$

c. $(-2 - 4i)(-5 + 7i)$

19. Use the quadratic formula to solve.

a. $x^2 + 4x + 5 = 0$

b. $2x^2 - 6x + 5 = 0$

Chapter 3 Review

1. Describe the End Behavior for the following functions. Write these as statements.

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

a. $y = -x^6 + 5x - 4$

b. $y = x^9 + x^3 - x^2 + 1$

c. $y = -x^7 - x^4 + 2x^2 + 1$

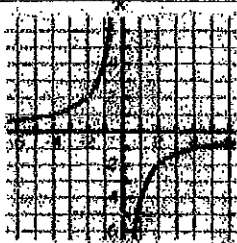
2. Describe the following as even or odd function.

A. $f(x) = -3x^2 + 4$ _____

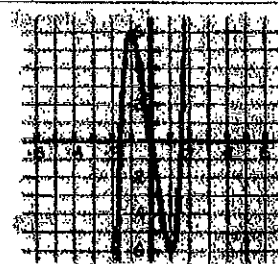
B. $f(x) = 2x^3 - 4x$ _____

C. $f(x) = 2x^3 - 3x^2 - 4x + x$ _____

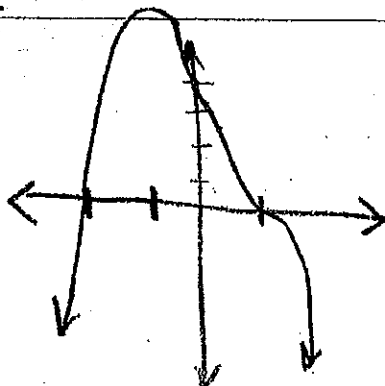
D.



E.



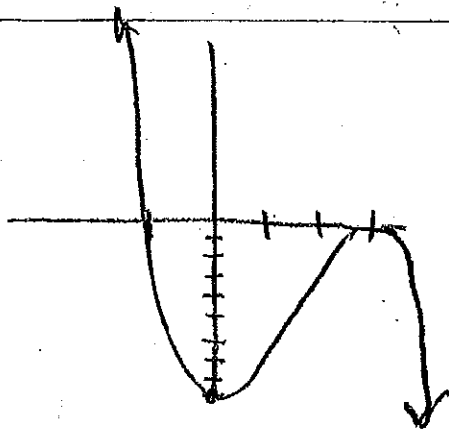
3. The graph contains x-intercepts at (1, 0) and (-2, 0) and a y-intercept at (0, 4). Write an equation to represent this function.



Function: _____

What is the degree of the function? _____

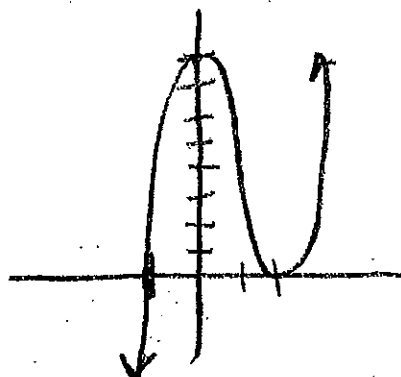
4. The graph contains x-intercepts at (3, 0) and (-1, 0) and a y-intercept at (0, -9). Write an equation to represent this function.



Function: _____

What is the degree of the function? _____

5. The graph contains x-intercepts at $(-1, 0)$ and $(2, 0)$ and a y-intercept at $(0, 8)$. Write an equation to represent this function.



Function: _____

What is the degree of the function? _____

6. Zeros and Multiplicities.

A. The graph of a polynomial intersects the x-axis at $-2, 0$, and 6 . Write the equation. Assume $a = 1$.

B. The graph of a polynomial intersects the x-axis at $-\frac{2}{3}, \frac{1}{3}, 0$. Write the equation. Assume $a = 1$.

C. What are the solutions to the function $5x^2 - 2x = 0$?

7. What are the zeros of the polynomial $2x^3 + x^2 - 2x - 1$ if $(x - 1)$ is a factor?

8. What are the zeros of the polynomial $x^3 + 2x^2 - 25x - 50$ if $(x - 5)$ is a factor?

Multiply the following.

9. $(3x + 1)(2x^2 - 4x - 5)$

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

11. $(4x - 3)(2x^2 + 5x - 7)$

CHAPTER 4 midterm Review

NAME: _____

NO CALCULATOR

- 1) A polynomial, $f(x)$, is divided by three different linear expressions, as listed in the table. The remainder after the division by each linear expression is also shown in the table.

Linear Expression	Remainder
$x+1$	2
$x-1$	4
$x+2$	0

Which must be a root of the polynomial equation, when $f(x) = 0$?

- A. 2
- B. -2
- C. 1
- D. -1

- 2) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$x^2 + 2x + 8 + \frac{19}{x-2}$$

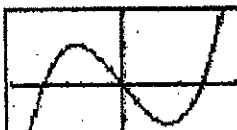
What is $g(x)$? Answer in the space provided.

- 3) What is the remainder when $f(x) = x^3 + 5x^2 - 20x - 39$ is divided by $x + 7$?

Write your answer in the space provided.

- 4) The graph of a function is shown. What could be the equation of the graph?

- A. $f(x) = -x^3 + 2x$
- B. $f(x) = x^2 - 2x$
- C. $f(x) = x^3 - 2x$
- D. $f(x) = -x^2 + 2x$



- 5) The 3rd term of the sequence is 12. Each term after the first is two times the previous term. Write an explicit function that models the general term of the sequence $f(n)$. Write your answer in the space provided.

CALCULATOR

- 6) A quadratic equation has the following coefficients: $a = 5$, $b = -10$, $c = 15$. Write the solution(s) of the equation. Enter one solution in each response box. If there is only one solution, leave one response box blank.

- 7) A quadratic equation is given as $3x^2 - 6x + 10 = 0$. Write the solution(s) of the equation in simplest form. Enter one solution in each response box. If there is only one solution, leave one response box blank.

- 8) A system of functions is given.

$$f(x) = x^2 - 4x - 5$$

$$g(x) = -x + 1$$

Select all values of x , to the nearest tenth, for which $f(x) = g(x)$.

- A. -2.1
- B. -1.4
- C. -1.0
- D. 0.9
- E. 4.0
- F. 4.4
- G. 5.0

- 9) Which equation has the root in addition to the same two roots of the equation $x^2 + 3x - 10 = 0$?

- A. $x^3 + x^2 - 4x - 20$
- B. $x^3 + 5x^2 - 4x - 20$
- C. $x^3 + x^2 - 16x - 20$
- D. $x^3 + 5x^2 + 16x - 20$

- 10) Two functions are shown.

$$f(x) = x^2 - 4x - 12$$

$$g(x) = x + 2$$

Circle all expressions equivalent to $\frac{f(x)}{g(x)}$.

- A. $\frac{x^2 + 7x + 6}{x + 1}$
- B. $2(x + 3)$
- C. $\frac{x^2 - 36}{x + 6}$
- D. $x - 6$
- E. $\frac{3x + 54}{9}$

Name: _____

ID: A

Write each function in vertex form. Vertex form: $a(x - h)^2 + k$

7. $x^2 + 2x - 48$

7) _____

8. $x^2 + 4x - 12$

8) _____

9. $3x^2 - 6x - 18$

9) _____

10. $2x^2 + 8x - 10$

10) _____

Characteristics of Quadratic Functions

Identify the following for each function:

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

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

2. $h(x) = 3(x - 2) + 1$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

3. $b(x) = (x + 7) - 5$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

4. $h(x) = (x - 8) + 6$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

5. $g(x) = x^2 + 6x + 8$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

6. $m(x) = x^2 - 8x + 15$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

7. $m(x) = 2x^2 + 3x + 1$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

8. $f(x) = 4x^2 - 4x - 3$

Form of Function: _____
Direction: _____
AOS: _____
Vertex: _____
Max or Min: _____
Max or Min Value: _____
Domain: _____
Range: _____

ID: A

9.

11.

10.

12.

QUADRATIC FUNCTIONS

Roots, Zeros, and Solutions WS

Name _____

Date _____ Period _____ ASM#: _____

Solve each equation by factoring.

1) $f(x) = b^2 - 11b + 28$ _____

2) $g(x) = v^2 - 12v + 36$ _____

3) $h(x) = 3n^2 + 23n - 8$ _____

4) $m(x) = 5x^2 + 47x + 56$ _____

5) $f(x) = 25x^2 - 9$ _____

6) $g(x) = 27x^2 - 12$ _____

Find the zeros for each function by factoring.

7) $2x = x^2 - 15$ _____

8) $-10x = x^2 + 24$ _____

9) $3x^2 - 7x - 6$ _____

10) $-15x = 14x^2 - 9$ _____

Write a quadratic function in standard form for each given set of zeros.

11) 3 and -4 _____

12) -8 and 0 _____

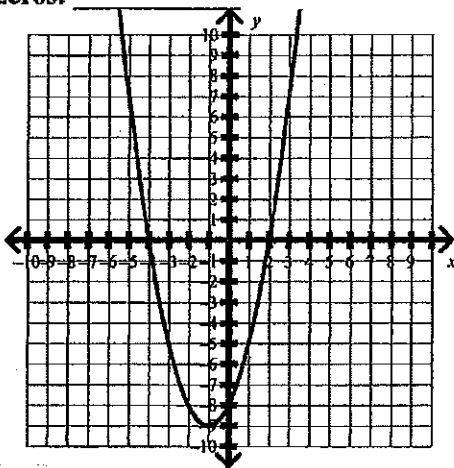
13) 9 and 2 _____

14) two zeros that have a sum of 8 _____

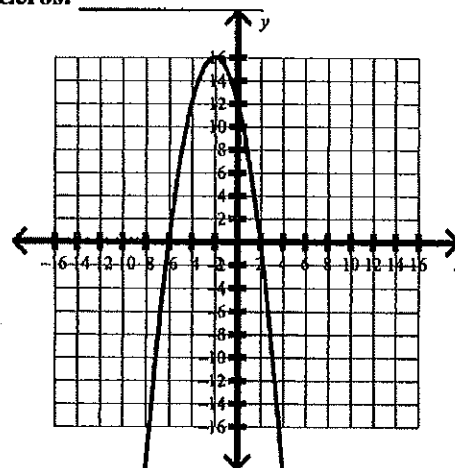
QUADRATIC FUNCTIONS

Identify the following for each quadratic function:

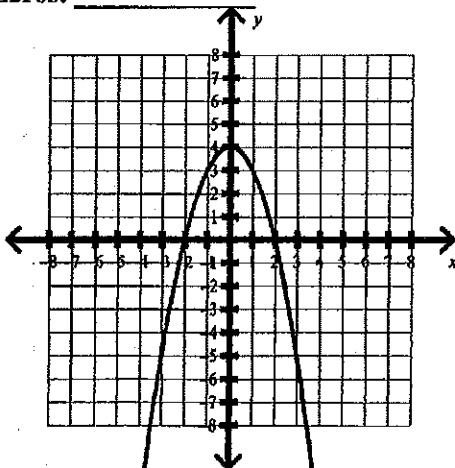
15. Direction: _____
 AOS: _____
 Vertex: _____
 Max/Min: _____
 Max/Min Value: _____
 Domain: _____
 Range: _____
 Y-intercept: _____
 Zeros: _____



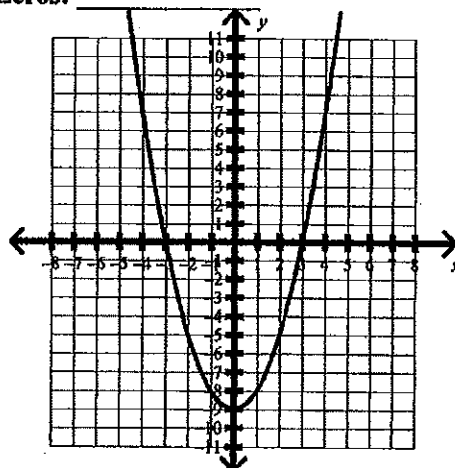
16. Direction: _____
 AOS: _____
 Vertex: _____
 Max/Min: _____
 Max/Min Value: _____
 Domain: _____
 Range: _____
 Y-intercept: _____
 Zeros: _____



17. Direction: _____
 AOS: _____
 Vertex: _____
 Max/Min: _____
 Max/Min Value: _____
 Domain: _____
 Range: _____
 Y-intercept: _____
 Zeros: _____



18. Direction: _____
 AOS: _____
 Vertex: _____
 Max/Min: _____
 Max/Min Value: _____
 Domain: _____
 Range: _____
 Y-intercept: _____
 Zeros: _____



QUADRATIC FUNCTIONS

Name _____

Roots, Zeros, and Solutions WS #2

Date _____ Period _____ ASM#: _____

Identify the roots of each quadratic function by factoring.

1) $f(x) = x^2 - 3x - 54$

2) $h(x) = 3n^2 - 16n + 5$

3) $f(x) = 4x^2 - 81$

4) $g(x) = 36x^2 - 4$

Find the zeros for each function by factoring.

5) $13x = x^2 + 40$

6) $-10x = x^2 + 30$

7) $2x^2 - 21x + 40 = 0$

8) $4x^2 - 25x - 21 = 0$

Write the solr of the equation.

9) A quadratic ion has the following coefficients: $a = 4$, $b = -3$, and $c = -7$.

10) A quadratic equation has the following coefficients: $a = 3$, $b = 13$, and $c = 12$.

11) A quadratic equation has the following coefficients: $a = 1$, $b = 5$, and $c = -36$.

12) A quadratic equation has the following coefficients: $a = 1$ and $c = -25$.

13) The polynomial $2x^2 + 7x + 6$ can be written as $(2x + 3)(x + 2)$. At which values of x does the graph of the polynomial cross the x -axis? One solution to x is in Box A and the other solution to x is in Box B.

Box A	Box B
3	-2
-1.5	2.5
-3	2
1.5	-2.5

14) The polynomial $3x^2 + 20x - 7$ can be written as $(3x - 1)(x + 7)$. At which values of x does the graph of the polynomial cross the x -axis? One solution to x is in Box A and the other solution to x is in Box B.

Box A	Box B
$\frac{1}{3}$	$\frac{1}{7}$
$-\frac{1}{3}$	$-\frac{1}{7}$
3	7
-3	-7

Writing an equation and finding zeros for quadratic functions.

- 15.** By using the table below write a quadratic function in standard form and state the zeros for the function.

x	2	4	6	8	10
f(x)	8	0	0	8	24

Equation: _____

Zeros: _____

- 16.** By using the table below write a quadratic function in standard form and state the zeros for the function.

x	-5	-4	-3	-2	-1
f(x)	8	3	0	-1	0

Equation: _____

Zeros: _____

Identify the following for each quadratic function:

- 17.** Direction: _____

AOS: _____

Vertex: _____

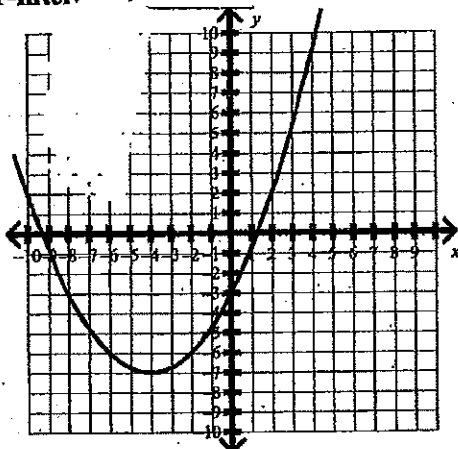
Max/Min: _____

Max/Min Value: _____

Domain: _____

Range: _____

Y-intercept: _____



- 18.** Direction: _____

AOS: _____

Vertex: _____

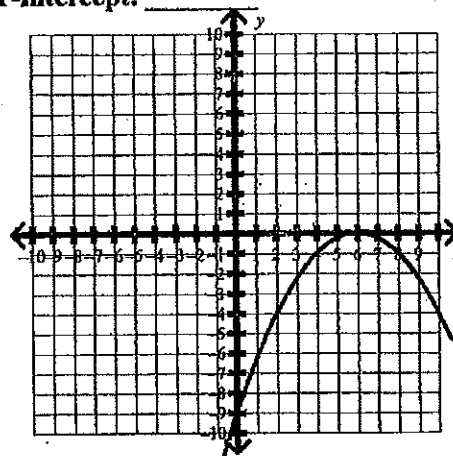
Max/Min: _____

Max/Min Value: _____

Domain: _____

Range: _____

Y-intercept: _____



Solutions, Roots, and Zeros WS #3

Identify each part of the quadratic function by graphing the polynomial in your calculator.

1) $x^2 - 10 = -3x$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

2) $r^2 = -11r - 24$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

3) $x^2 = 8x$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

4) $3x^2 = -48$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

5) $2x^2 - 5x + 3$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

6) $x^2 - 8x + 30$

Vertex: _____

AOS: _____

Y-intercept: _____

Max or Min Value: _____

Type of Zeros: _____

Number of Zeros: _____

Identify the zeros: _____

Write the solutions for each equation.

- 7) A quadratic equation has the following coefficients: $a=5$, $b=31$, and $c=30$.

- 8) A quadratic equation has the following coefficients: $a=3$, $b=-23$, and $c=30$.

- 9) A quadratic equation has the following coefficients: $a=16$, and $c=-25$.

- 10) A quadratic equation has the following coefficients: $a=1$, $b=-5$, and $c=-14$.

Write each function in vertex form. Vertex form: $y = a(x - h)^2 + k$

11) $x^2 - 4x - 12$

12) $x^2 + 2x - 18$

13) $2x^2 + 17x + 30$

14) $3x^2 - 5x + 2$

Factoring & Dividing Polynomials WS #1

Name _____

Date _____

ASM: _____

1) $x^2 + 10x + 16$ _____

2) $x^2 - 12x + 27$ _____

3) $x^2 + 2x - 48$ _____

4) $x^2 - 7x - 18$ _____

5) $2x^2 + 13x + 18$ _____

6) $2x^2 - 3x + 35$ _____

- 7) A quadratic equation has the following coefficients: $a = 1$, $b = 15$, $c = 56$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 8) A quadratic equation has the following coefficients: $a = 1$, $b = -17$, $c = 72$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 9) A quadratic equation has the following coefficients: $a = 1$, $b = -1$, $c = -30$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 10) A quadratic equation has the following coefficients: $a = 1$, $b = 13$, $c = -48$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 11) A quadratic equation has the following coefficients: $a = 4$, $b = 19$, $c = 12$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 12) A quadratic equation has the following coefficients: $a = 3$, $b = -22$, $c = 35$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 13) A quadratic equation has the following coefficients: $a = 5$, $b = 39$, $c = -8$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 15) The polynomial $x^2 + 13x - 48$ can be written as $(x + 16)(x - 3)$. At which values of x does the graph of the polynomial cross the x -axis?

$x =$ _____, $x =$ _____

- 17) The polynomial $x^2 - 9$ can be written as $(x - 3)(x + 3)$. At which values of x does the graph of the polynomial cross the x -axis?

$x =$ _____, $x =$ _____

FIND $g(x)$?

- 19) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$x^2 - 3x + 5 - \frac{4}{x + 8}, \text{ Find } g(x).$$

$g(x) =$ _____

- 21) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$2x + 3 - \frac{4}{x + 5}, \text{ Find } g(x).$$

$g(x) =$ _____

- 23) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$x^3 - 2x^2 + x - 5 + \frac{2}{x - 2}, \text{ Find } g(x).$$

$g(x) =$ _____

- 14) A quadratic equation has the following coefficients: $a = 4$, $c = -49$. Write the solution(s) of the equation. Enter each solution in one blank.

$x =$ _____, $x =$ _____

- 16) The polynomial $3x^2 - 13x + 14$ can be written as $(x - 2)(3x - 7)$. At which values of x does the graph of the polynomial cross the x -axis?

$x =$ _____, $x =$ _____

- 18) The polynomial $25x^2 - 9$ can be written as $(5x + 3)(5x - 3)$. At which values of x does the graph of the polynomial cross the x -axis?

$x =$ _____, $x =$ _____

- 20) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$x^2 + 4x + 9 + \frac{3}{x - 3}, \text{ Find } g(x).$$

$g(x) =$ _____

- 22) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$3x - 2 - \frac{4}{2x + 9}, \text{ Find } g(x).$$

$g(x) =$ _____

- 24) The polynomial $g(x)$ is divided by a binomial. The result is shown below.

$$x^3 - 8x^2 + 3x - 5 + \frac{8}{x - 9}, \text{ Find } g(x).$$

$g(x) =$ _____

LESSON
5.2
Practice A
Properties of Quadratic Functions in Standard Form

Identify the axis of symmetry for the graph of each function.

1. $f(x) = -(x - 4)^2 - 6$

2. $g(x) = 5(x - 2)^2 + 4$

3. $g(x) = 12(x + 6)^2 - 5$

4. $f(x) = -3(x + 1)^2 - 7$

Tell whether each statement is true or false.

5. The graph of a quadratic function is always a parabola.

6. The graphs of all quadratic functions open upward.

7. The graph of $f(x) = x^2$ has a maximum value at $(0, 0)$.

For the following functions, (a) determine whether the graph opens upward or downward. Then find (b) the axis of symmetry, (c) the vertex, and (d) the y-intercept. Graph each function. Then (e) determine if the function has a minimum or a maximum and (f) find the value of the minimum or maximum.

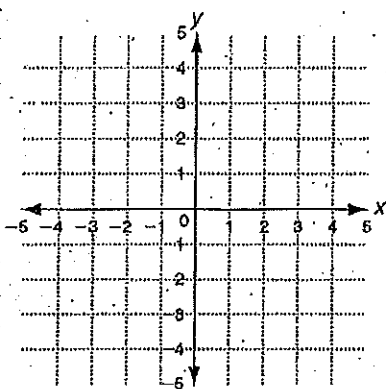
8. $g(x) = 3x^2 + 2x + 1$

a. _____

b. _____

c. _____

d. _____



e. _____

f. _____

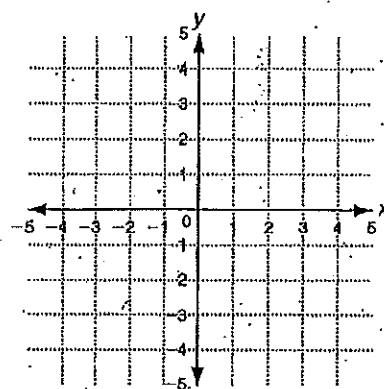
9. $f(x) = -2x^2 - 4x - 2$

a. _____

b. _____

c. _____

d. _____



e. _____

f. _____

LESSON**5-2****Practice B****Properties of Quadratic Functions in Standard Form**

Identify the axis of symmetry for the graph of each function.

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

2. $h(x) = -8x^2 + 12x - 11$

3. $k(x) = -4(x + 3)^2 + 9$

For each function, (a) determine whether the graph opens upward or downward, (b) find the axis of symmetry, (c) find the vertex, and (d) find the y-intercept. Then graph the function.

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

a. Upward or downward _____

b. Axis of symmetry _____

c. Vertex _____

d. y-intercept _____

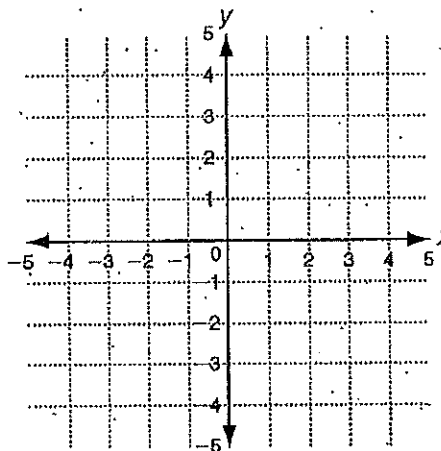
5. $g(x) = 2x^2 + 4x - 2$

a. Upward or downward _____

b. Axis of symmetry _____

c. Vertex _____

d. y-intercept _____



Find the minimum or maximum value of each function. Then state the domain and range of the function.

6. $g(x) = x^2 - 2x + 1$

7. $h(x) = -5x^2 + 15x - 3$

Solve.

8. A record label uses the following function to model the sales of a new release.

$$a(t) = -90t^2 + 8100t$$

The number of albums sold is a function of time, t , in days. On which day were the most albums sold? What is the maximum number of albums sold on that day?

Complex #'s & Radicals WS

Name _____

Date _____ Period _____ ASM#: _____

Add or Subtract

1) $(4 - 9i) + (7 + 3i)$ _____

2) $(-2 + 5i) - (10 - i)$ _____

3) $(13 + 6i) - (5 + 9i)$ _____

4) $(3 + 8i) + (4 - 12i)$ _____

5) $15 + 18i - 3(2i + 9 - 8i) + 24 - 30i$ _____

6) $19i - 17 + 4(3i - 5 + 2i) - 18 + 3i$ _____

Find the product.

7) $(2 - 4i)(9 + 2i)$ _____

8) $(3 + 5i)(2 - 7i)$ _____

9) $(5 - 3i)(6 - 10i)$ _____

10) $(3 + 10i)(8 + 5i)$ _____

Simplify

11) $\sqrt{24}$ _____

12) $\sqrt{32}$ _____

13) $\sqrt{25}$ _____

14) $\sqrt{36}$ _____

15) $\sqrt{49}$ _____

16) $\sqrt{63}$ _____

17) $\sqrt{72}$ _____

18) $\sqrt{150}$ _____

SECTION 2.1 PART 1

For each of the functions determine the following:

1. $f(x) = x^2 - 4x + 5$

Direction: _____

AOS: _____

Vertex: _____

Y-intercept: _____

Max/Min Value: _____

Domain: _____

Range: _____

Graph the function

2. $f(x) = x^2 - 2x - 8$

Direction: _____

AOS: _____

Vertex: _____

Y-intercept: _____

Max/Min Value: _____

Domain: _____

Range: _____

Graph the function

3. $f(x) = 2x^2 + 4x - 6$

Direction: _____

AOS: _____

Vertex: _____

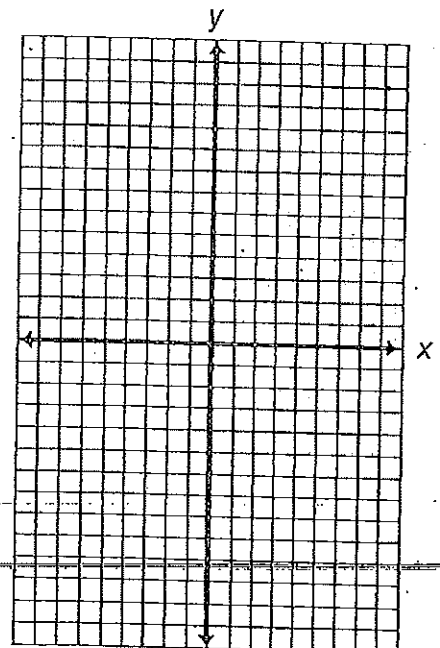
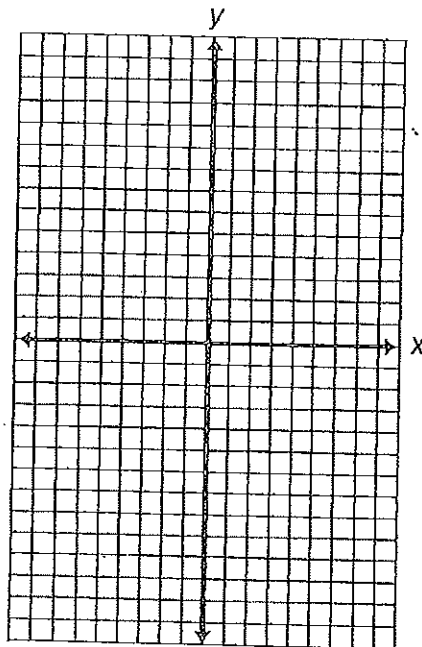
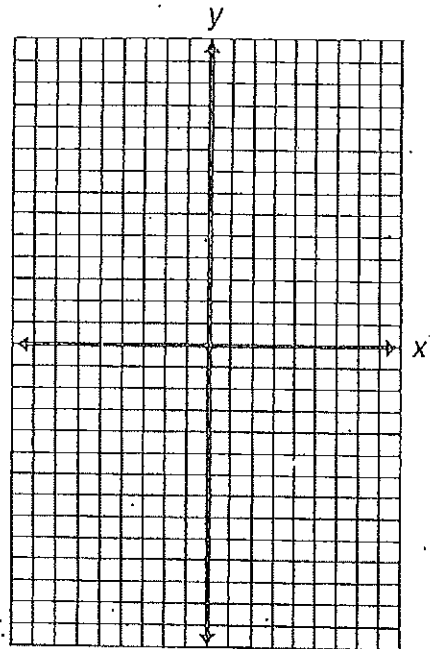
Y-intercept: _____

Max/Min Value: _____

Domain: _____

Range: _____

Graph the function



Conversions

4. Factored Form to Standard Form

$f(x) = (x - 5)(x + 2)$

4) _____

Name: _____

ID: A

5. Factored Form to Standard Form

$$f(x) = (x + 7)(x + 6)$$

5) _____

6. Factored Form to Standard Form

$$f(x) = 3(x - 2)(x + 5)$$

6) _____

7. Factored Form to Standard Form

$$f(x) = -2(x + 9)(x - 1)$$

7) _____

8. Vertex Form to Standard Form

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

8) _____

9. Vertex Form to Standard Form

$$f(x) = 2(x + 4)^2 - 8$$

9) _____

10. Vertex Form to Standard Form

$$f(x) = -5(x + 6)^2 + 3$$

10) _____

11. Vertex Form to Standard Form

$$f(x) = (x - 9)^2 - 2$$

11) _____