

## QUADRATIC UNIT REVIEW

Date \_\_\_\_\_ Algebra \_\_\_\_\_

## TOPIC 1 : ALGEBRAIC SOLUTIONS TO QUADRATICS:

Solve each equation by factoring. Leave your answers as fractions if need be.

1)  $m^2 + m - 42 = 0$

 $\{6, -7\}$ 

2)  $-4r^2 + 5 = -5r^2 + 6r$

 $\{5, 1\}$ 

3)  $6m^2 - 25m = -21$   $\left\{\frac{7}{6}, 3\right\}$

4)  $3r^2 - 15 = 12r$

 $\{5, -1\}$ 

Solve each equation by completing the square. Round your answers to the nearest THOUSANDTH if needed.

5)  $x^2 - 8x - 65 = 0$

 $\{13, -5\}$ 

6)  $n^2 - 14n + 44 = 4$

 $\{10, 4\}$ 

7)  $-97 - 14n = -7n^2$

 $\{4.854, -2.854\}$ 

8)  $5x^2 + 18x - 66 = 4x^2$

 $\{3.124, -21.124\}$ 

Solve each equation with the quadratic formula. Round your answers to the thousandth place if needed

9)  $-r^2 - 12r - 20 = 0$

 $\{-10, -2\}$ 

10)  $3x^2 + 7x - 76 = 0$

 $\{4, -6.333\}$ 

11)  $7n^2 - 110 = 3n^2 - 10$

 $\{5, -5\}$ 

12)  $3v^2 - 6v - 110 = 2 - 11v$

 $\{5.333, -7\}$ 

Find the discriminant of each quadratic equation then state the number and type of solutions.

13)  $-4m^2 + 8m - 4 = 0$

0; one real solution

14)  $-8r^2 + 6r + 5 = 0$

196; two real solutions

15)  $8v^2 + 3v + 4 = -5v$

-64; two imaginary solutions

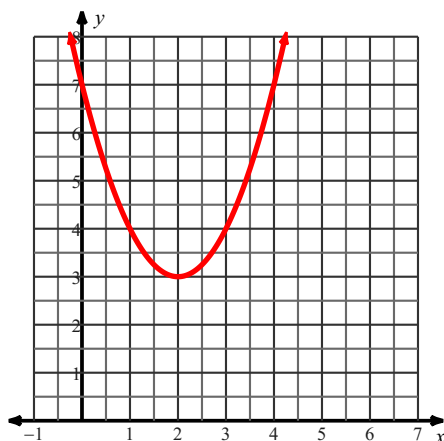
16)  $n^2 + 6n + 6 = n$

1; two real solutions

## TOPIC 2: GRAPHING PARABOLAS AND IDENTIFYING THEIR PARTS

Use your graphing calculator to sketch the graph of the following parabolas and answer the accompanying questions.

17)  $y = x^2 - 4x + 7$



18) Fill in the following for the parabola in number 17:

V: (2, 3)

AOS:  $x = 2$ 

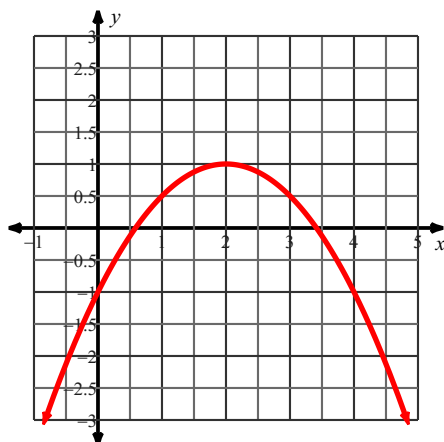
Roots: No Real

Vertex: \_\_\_\_\_

AOS: \_\_\_\_\_

ROOTS: \_\_\_\_\_

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



- 20) Fill in the following for the parabola in number 19: V: (2, 1)  
AOS:  $x = 2$   
Roots:  $x = 1.5$

Vertex: \_\_\_\_\_

AOS: \_\_\_\_\_

ROOTS: \_\_\_\_\_

**Find the VERTEX, AOS and ROOTS of the following quadratics ALGEBRAICALLY!!!!**

21)  $y = 2x^2 + 12x + 16$  V : (-3, -2)

AOS:  $x = -3$

Roots:  $x = -2, -4$

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

v: (2,2)

aos:  $x = 2$

Roots: No Real Roots

22)  $y = 2x^2 + 4x + 6$  V : (-2,2)

AOS:  $x = -2$

24)  $f(x) = -x^2 + 6x - 5$  Roots: (1,4) No Real Roots

Aos:  $x = 3$

Roots:  $x = 1, 5$

### TOPIC 3: FUNCTIONS AND MODELING

**Answer the following quesitons for the given quadratic.**

25) Fill in the blanks for  $f(x) = 3x^2 - 6x + 1$  106, 1, 505

when  $x = -5$ ,  $f(x) =$  \_\_\_\_\_

when  $x = 0$ ,  $f(x) =$  \_\_\_\_\_

when  $x = 14$ ,  $f(x) =$  \_\_\_\_\_

when  $f(x) = 10$ ,  $x =$  \_\_\_\_\_

when  $f(x) = -2$ ,  $x =$  \_\_\_\_\_

when  $f(x) = -5$ ,  $x =$  \_\_\_\_\_

-1, 3

1

DNE

26) Fill in the blanks for  $f(x) = -\frac{1}{4}x^2 + 5$

when  $x = -2$ ,  $f(x) =$  \_\_\_\_\_

when  $x = 25$ ,  $f(x) =$  \_\_\_\_\_

when  $f(x) = -11$ ,  $x =$  \_\_\_\_\_

when  $f(x) = 1$ ,  $x =$  \_\_\_\_\_

4, -151.3

-8, 8

-4, 4

Give an example of a fucntion value for which there are no posisble x values:

$f(x) =$  \_\_\_\_\_

### Writing Quadratic Equations

27) The square of a positive number is 24 more than 5 times the number.

a. Write a quadratic equation that represents this situation using  $n =$  number.

b. Solve your euqation to find the value of the number.

The number is 8.

28) Rachel is six years older than her brother, Brian. The product of their ages is 667.

- Define a variable for this problem:
- Write a quadratic equation that represents this situation.
- Solve your equation and clearly state the ages of both Rachel and Brian.

29 and 23

29) Find two consecutive EVEN integers whose product is 204.

- Define a variable for this problem:
- Write a quadratic equation that represents this situation.
- Solve your equation and clearly state the value of the integers.

44 + 46

30) The number of thousands of downloads of a new song can be modeled by the function:

$$g(x) = -\frac{1}{4}x^2 + 4x + 1 \text{ where } x \text{ represents the number of weeks since the song is released.}$$

- What is the maximum number of downloads in one week?
- After how many weeks did the song reach its maximum download amount?
- How many times was the song downloaded in week 1: \_\_\_\_, Week 2: \_\_\_\_, Week 3: \_\_\_\_  
What was the TOTAL number of downloads from week 1 to week 3?
- After how many weeks did the song stop getting downloaded?
- What is the total number of downloads for the song over the whole time?

- 17,000
- 8
- 1 = 4.75, 1
- 23,500
- about 16 weeks
- 186,000