

Algebra 2

REVIEW 4.1-4.2, 4.4-4.5

Name Key

Date _____ Hour _____

1. Identify the vertex, the axis of symmetry, the maximum or minimum value, y intercept, domain and the range of each quadratic function. Also, fill out the table and sketch the graph.

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

Vertex: (3, 2)

AOS: X=3

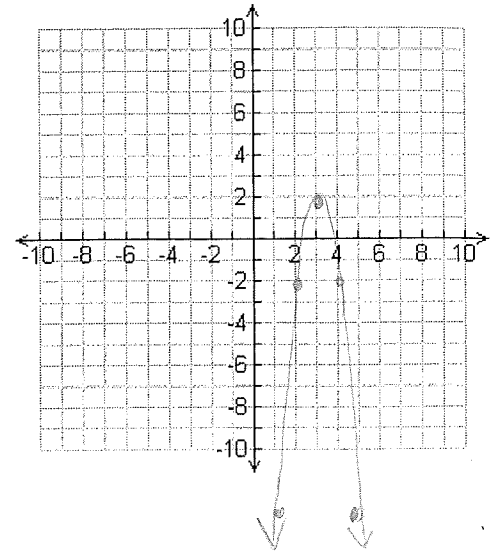
Max / Min: MAX

Y intercept: (0, -34)

Domain: all

Range: $y \leq 2$

$y=x^2$		$x+3$					
x	y	x	y	x	y	x	y
-2	4	1	4	1	-16	1	-14
-1	1	2	1	2	-4	2	-2
0	0	3	0	3	0	3	2
1	1	4	1	4	-4	4	-2
2	4	5	4	5	-16	5	-14



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

Vertex: (-4, -2)

AOS: X=-4

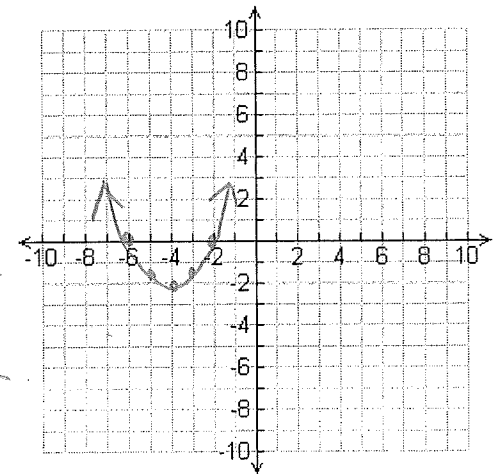
Max / Min: MIN

Y intercept: (0, 6)

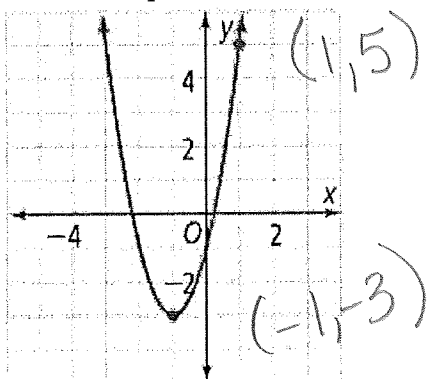
Domain: all

Range: $y \geq -2$

$y=x^2$		$x-4$					
x	y	x	y	x	y	x	y
-2	4	-6	4	-6	2	-6	0
-1	1	-5	1	-5	1/2	-5	-1 1/2
0	0	-4	0	-4	0	-4	-2
1	1	-3	1	-3	1/2	-3	-1 1/2
2	4	-2	4	-2	2	-2	0



2. Write the quadratic function in vertex form to model the following graph. Show your work.



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

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

$$5 = a(1+1)^2 - 3$$

$$5 = 4a - 3$$

$$8 = 4a$$

$$2 = a$$

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

3. Write the equation of the parabola in vertex form given the vertex is $(-3, 7)$ and passes through the point $(-2, -5)$.
Show your work.

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

$$-5 = a(-2+3)^2 + 7$$

$$-5 = 1a + 7$$

$$-12 = a$$

3. $y = -12(x+3)^2 + 7$

4. Rewrite $f(x) = 6(x-3)^2 - 4$ in standard form. Show your work.

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

$$f(x) = 6(x^2 - 6x + 9) - 4$$

$$f(x) = 6x^2 - 36x + 54 - 4$$

$$f(x) = 6x^2 - 36x + 50$$

4. $f(x) = 6x^2 - 36x + 50$

5. Identify the vertex, the axis of symmetry, the maximum or minimum value, up or down, y intercept, domain and the range of each quadratic function. Sketch the graph.

a. $f(x) = 3x^2 + 18x + 4$

$$x = \frac{-b}{2a} = \frac{-18}{2(3)} = \frac{-18}{6} = -3$$

$$y = 3(-3)^2 + 18(-3) + 4$$

$$27 - 54 + 4$$

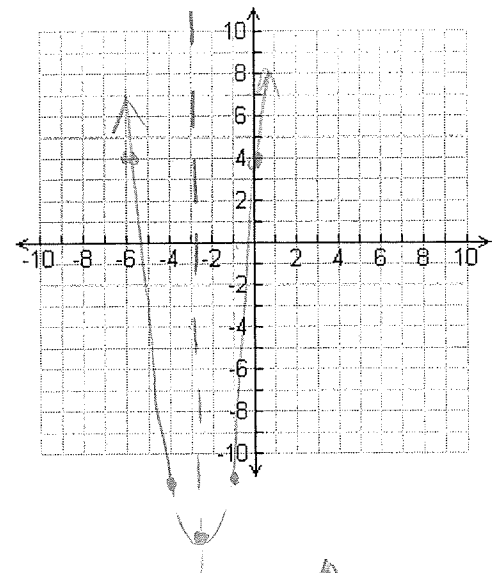
$$27 - 50$$

$$y = -23$$

$$3 - 18 + 4$$

$$(-1, -11)$$

Vertex: $(-3, -23)$
 AOS: $x = -3$
 Max / Min: _____ Up / Down: _____
 Y intercept: $(0, 4)$
 Domain: all real numbers
 Range: $y \geq -23$



b. $f(x) = -x^2 + 6x - 10$

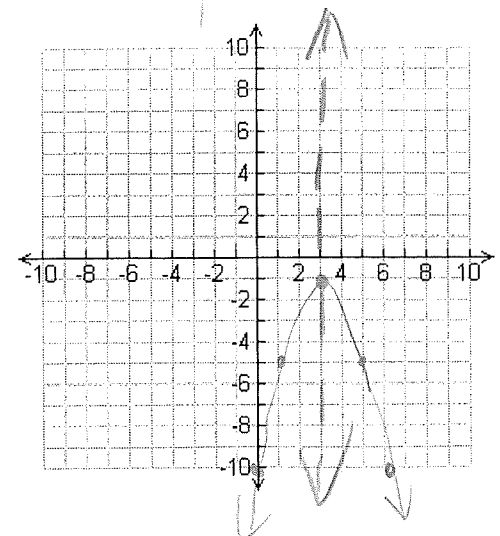
$$x = \frac{-b}{2a} = \frac{-6}{2(-1)} = \frac{-6}{-2} = 3$$

$$-9 + 18 - 10$$

$$9 - 10$$

$$-1$$

Vertex: $(3, -1)$
 AOS: $x = 3$
Max / Min: _____ Up / Down: _____
 Y intercept: $(0, -10)$
 Domain: all real numbers
 Range: _____



5. Convert $f(x) = 2x^2 + 4x - 4$ to vertex form. Show your work.

vertex
 $(-1, -6)$

$$x = \frac{-b}{2a} = \frac{-4}{4} = -1$$

$$y = 2 + -4 - 4$$

$$y = -6$$

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

Factor each polynomial **completely**. There may be more than one method. HINT: GCF something first. **SHOW ALL WORK**

6. $4x^2 - 25$

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

7. $9x^2 - 6x + 1$

$3 \times 3 \times (1 \times 1)$
 $(3x-1)(3x-1)$
 $(3x-1)^2$

6. $(2x-5)(2x+5)$

7. $(3x-1)^2$

8. $x^2 - 10x + 21$

$(x-7)(x-3)$

9. $4x^2 + 21x + 9$

36

1	36	prime
2	18	
3	12	
4	9	

8. $(x-7)(x-3)$

9. Prime

10. $2x^2 + 9x + 7$

14
 $2x^2 + 2x + 7x + 7$
 $2x(x+1) + 7(x+1)$
 $(x+1)(2x+7)$

10. $(x+1)(2x+7)$

Solve each polynomial by factoring. Show your work.

11. $4x^2 - 49 = 0$

$(2x-7)(2x+7) = 0$

$2x-7=0$ $2x+7=0$
 $x=7/2$ $x=-7/2$

12. $5x^2 + 7x = 6$

$5x^2 + 7x - 6 = 0$

$(5x-3)(x+2) = 0$

$x = 3/5$ $x = -2$

11. $x = \pm 7/2$

12. $3/5, -2$

change ⁻³⁰

13. $2x^2 - 3x = 15$

$$2x^2 - 1x - 15 = 0$$

$$(2x + 3)(x - 3) = 0$$

$$x = -3/2 \quad x = 3$$

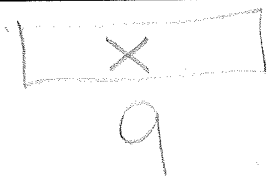
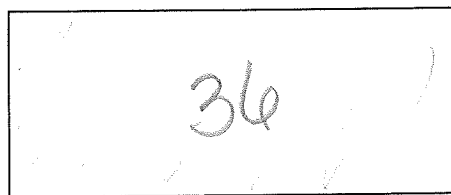
14. $(3x - 1)(x - 5) = 0$

$$x = 1/3 \quad x = 5$$

13. 1/3, 5

14. -3/2, 3

15. The width of a rectangle is 5 centimeters shorter than its length. If the area of the rectangle is 36 square centimeters, what is its length?



$$x(x-5) = 36$$

$$x^2 - 5x = 36$$

$$x^2 - 5x - 36 = 0$$

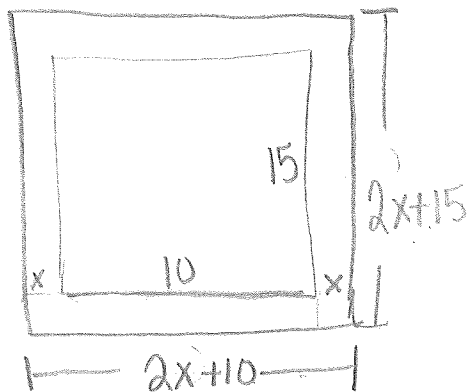
$$(x-9)(x+4) = 0$$

$$x = 9 \quad x = -4$$

15. 9 cm x 4 cm

Bonus

16. Suppose you have a picture that you would like to frame. The picture measures 15 in. by 10 in. The frame will be the same width around the entire painting. If you have 264 in.² of framing material, how wide should the frame be?



$$(2x+15)(2x+10) = 264$$

$$4x^2 + 20x + 30x + 150 = 264$$

$$4x^2 + 50x + 150 = 264$$

$$4x^2 + 50x - 114 = 0$$

$$2(2x + 25x - 57) = 0$$

16. _____