

Algebra 2 Chapter 4
Quadratic Functions and Relations Review

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1. Label a, b, and c for this quadratic:

$$y = 2x^2 - 5x + 11$$

a = 2 b = -5 c = 11

2. Label h, and k for this quadratic:

$$y = 2(x + 8)^2 - 3$$

h = -8 k = -3

3. Graph the quadratic function: $y = -2x^2 + 4x - 3$

VERTEX = (1, -1) (Max or Min)

AXIS OF SYMMETRY = X = 1

Y intercept = (0, -3)

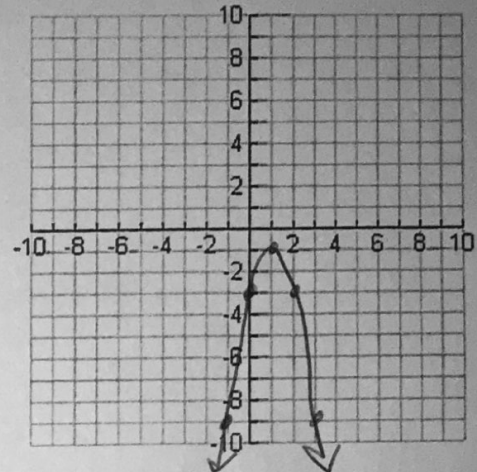
DOMAIN = \mathbb{R}

RANGE = $y \leq -1$

ZERO(s) = none real
(2 imaginary)

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

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



4. Graph the quadratic equation: $y = -(x - 0)(x + 6)$

VERTEX = (-3, 9) (Max or Min)

AXIS OF SYMMETRY = X = -3

Y intercept = (0, 0)

DOMAIN = \mathbb{R}

RANGE = $y \leq 9$

ZERO(s) = X = -6, X = 0

$$x = 0 \quad x = -6$$

$$-(-3-0)(-3+6)$$

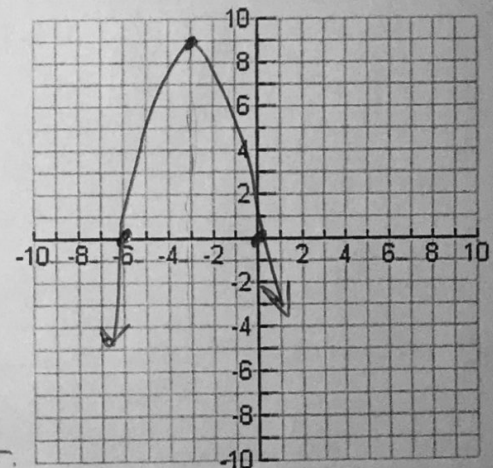
$$-(-3)(3)$$

$$9 \rightarrow \text{vertex}$$

$$-(0-0)(0+6)$$

$$-0(6)$$

$$0 \rightarrow \text{y-int.}$$



5. Graph the quadratic function: $y = (x - 4)^2 + 1$

VERTEX = (4, 1) Max or Min

AXIS OF SYMMETRY = X = 4

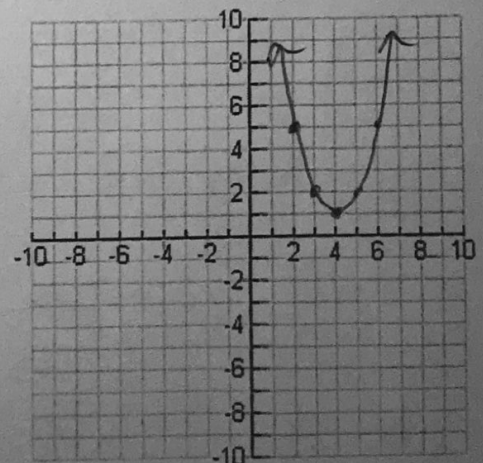
Y intercept = (0, 17)

DOMAIN = \mathbb{R}

RANGE = $y \geq 1$

ZERO(s) = none real
(2 imaginary)

x	y
2	5
3	2
4	1
5	2
6	5



Solve the following quadratics by Factoring.

6. $x^2 - 6x - 16 = 0$

$$(x-8)(x+2) = 0$$

$$x-8=0 \quad x+2=0$$

$$\boxed{x=8}$$

$$\boxed{x=-2}$$

7. $x^2 - 12x + 32 = 0$

$$(x-4)(x-8) = 0$$

$$x-4=0$$

$$\boxed{x=4}$$

$$x-8=0$$

$$\boxed{x=8}$$

8. $5x^2 - 11x + 2 = 0$

$$x^2 - 11x + 10 = 0$$

$$(x-\frac{1}{5})(x-\frac{10}{5}) = 0$$

$$(5x-1)(x-2) = 0$$

$$5x-1=0$$

$$5x=1$$

$$\boxed{x=\frac{1}{5}}$$

$$x-2=0$$

$$\boxed{x=2}$$

10. $x^2 + 4x + 4 = 0$

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

$$x+2=0$$

$$\boxed{x=-2}$$

← same factor twice!
only one solution

9. $3x^2 + 8x + 5 = 0$

$$x^2 + 8x + 15 = 0$$

$$(x+\frac{3}{3})(x+\frac{5}{3}) = 0$$

$$(x+1)(3x+5) = 0$$

$$x+1=0$$

$$\boxed{x=-1}$$

$$3x+5=0$$

$$3x=-5$$

$$\boxed{x=-\frac{5}{3}}$$

11. $x^2 - 4 = 0$

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

$$x+2=0$$

$$\boxed{x=-2}$$

$$x-2=0$$

$$\boxed{x=2}$$

12. $9x^2 - 25 = 0$

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

$$3x+5=0$$

$$3x=-5$$

$$\boxed{x=-\frac{5}{3}}$$

$$3x-5=0$$

$$3x=5$$

$$\boxed{x=\frac{5}{3}}$$

13. $2x^2 + 9x + 7 = 0$

$$x^2 + 9x + 14 = 0$$

$$(x+\frac{7}{2})(x+\frac{2}{2}) = 0$$

$$(2x+7)(x+1) = 0$$

$$2x+7=0$$

$$2x=-7$$

$$\boxed{x=-\frac{7}{2}}$$

$$x+1=0$$

$$\boxed{x=-1}$$

Solve the following Quadratic equations by Square Root method

14. $2x^2 - 5 = 13$

$$2x^2 = 18$$

$$x^2 = 9$$

$$x = \pm 3$$

15. $3x^2 = -12$

$$x^2 = -4$$

$$x = \pm 2i$$

16. $6(x-1)^2 - 1 = 23$

$$6(x-1)^2 = 24$$

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

$$x-1 = \pm 2$$

$$x-1 = 2 \quad x-1 = -2$$

$$x = 3$$

$$x = -1$$

17. $(x+4)^2 + 2 = 11$

$$(x+4)^2 = 9$$

$$x+4 = \pm 3$$

$$x+4 = 3 \quad x+4 = -3$$

$$x = -1$$

$$x = -7$$

Solve the following Quadratic equations by the Quadratic Formula.

18. $-2x^2 - 3x + 4 = 0$

$$a = -2 \quad b = -3 \quad c = 4$$

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(-2)(4)}}{2(-2)}$$

$$x = \frac{3 \pm \sqrt{9-32}}{-4} = \frac{3 \pm \sqrt{-23}}{-4}$$

$$x = \frac{3 \pm i\sqrt{23}}{-4}$$

19. $-5x^2 = 2x - 1$

$$-5x^2 - 2x + 1 = 0$$

$$a = -5 \quad b = -2 \quad c = 1$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(-5)(1)}}{2(-5)}$$

$$x = \frac{2 \pm \sqrt{4+20}}{-10} = \frac{2 \pm \sqrt{24}}{-10} \text{ OR}$$

$$x = \frac{2 \pm 2\sqrt{6}}{-10} = \frac{1 \pm \sqrt{6}}{-5} \text{ simplified}$$

For each quadratic below, find the discriminant and tell the number and type of solutions.

20. $-2x^2 + 6x - 1 = 0$

$$a = -2 \quad b = 6 \quad c = -1$$

$$b^2 - 4ac$$

$$36 - 8$$

28 \rightarrow 2 real solutions

21. $-3x^2 = 6x - 3$

$$-3x^2 - 6x + 3 = 0$$

$$a = -3 \quad b = -6 \quad c = 3$$

$$(-6)^2 - 4(-3)(3)$$

$$36 + 36$$

72 \rightarrow 2 real solutions