Ch 9 Study Party

$x = \frac{-b}{2a}$ axis of sym $(x, \quad)$

1) Find the vertex:

$$y = 0.5x^2 + 8x + 1$$

$a = .5$
$b = 8$
$c = 1$

$x = \frac{-8}{1} = -8$

$(-8, -31)$

$y = .5(-8)^2 + 8(-8) + 1$
$.5(64)$
$32 - 64 + 1$
$-32 + 1$
-31

2) Find the axis of symmetry: → $x = -\frac{b}{2a}$

$y = -x^2 - 14x + 12$

$a = -1$

$b = -14$

$c = 12$

$x = \frac{14}{-2} = -7$

$\boxed{x = -7}$

3) Find the solutions:

$$-3x^2 - 7 = -19$$

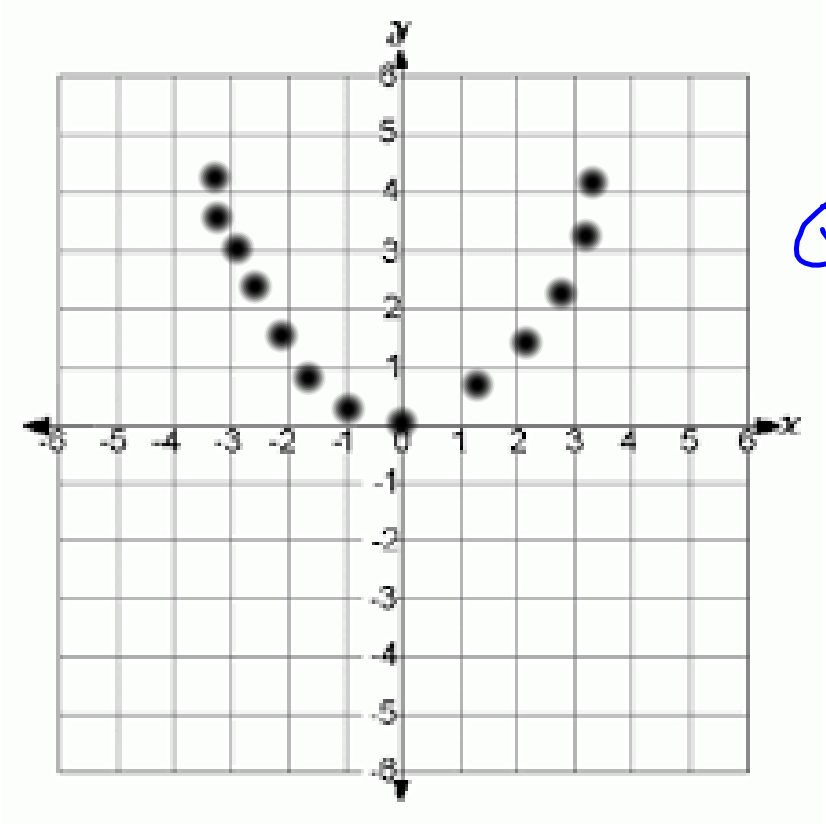
$+7 \quad +7$

$$\frac{-3x^2}{-3} = \frac{-12}{-3}$$

$$\sqrt{x^2} = \sqrt{4}$$

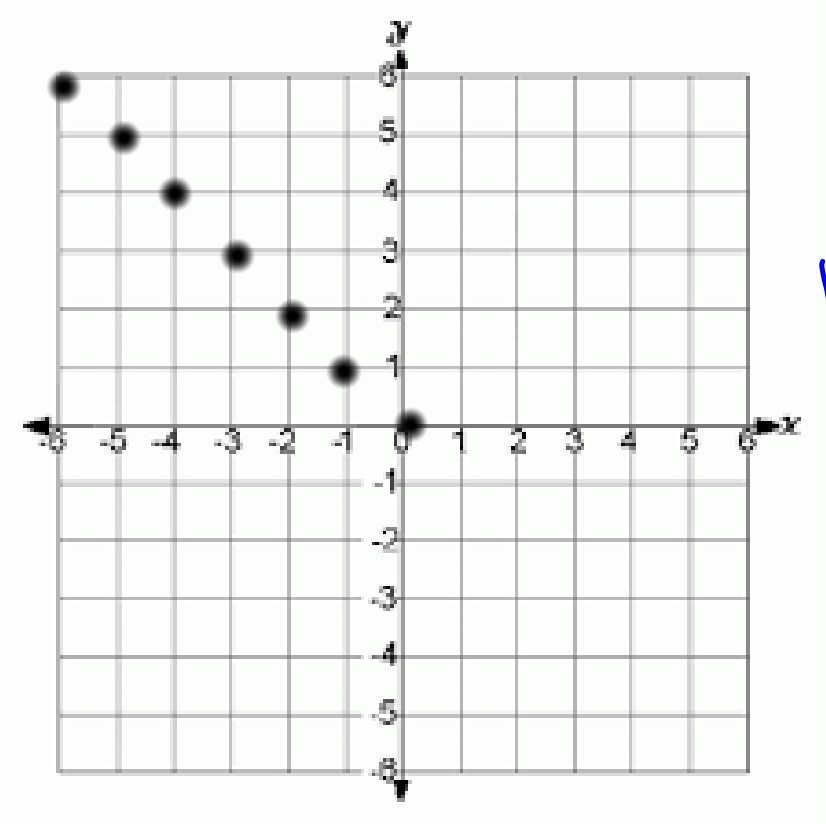
$$\boxed{x = \pm 2}$$

4) Label whether this is exponential, linear, or quadratic.



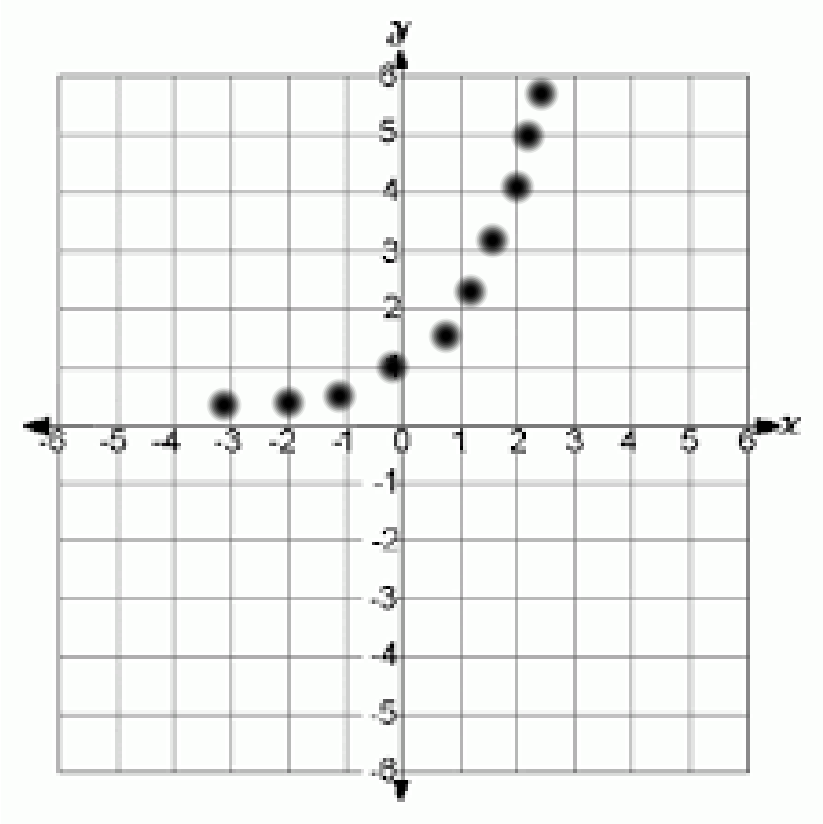
Quad

5) Label whether this is exponential, linear, or quadratic.



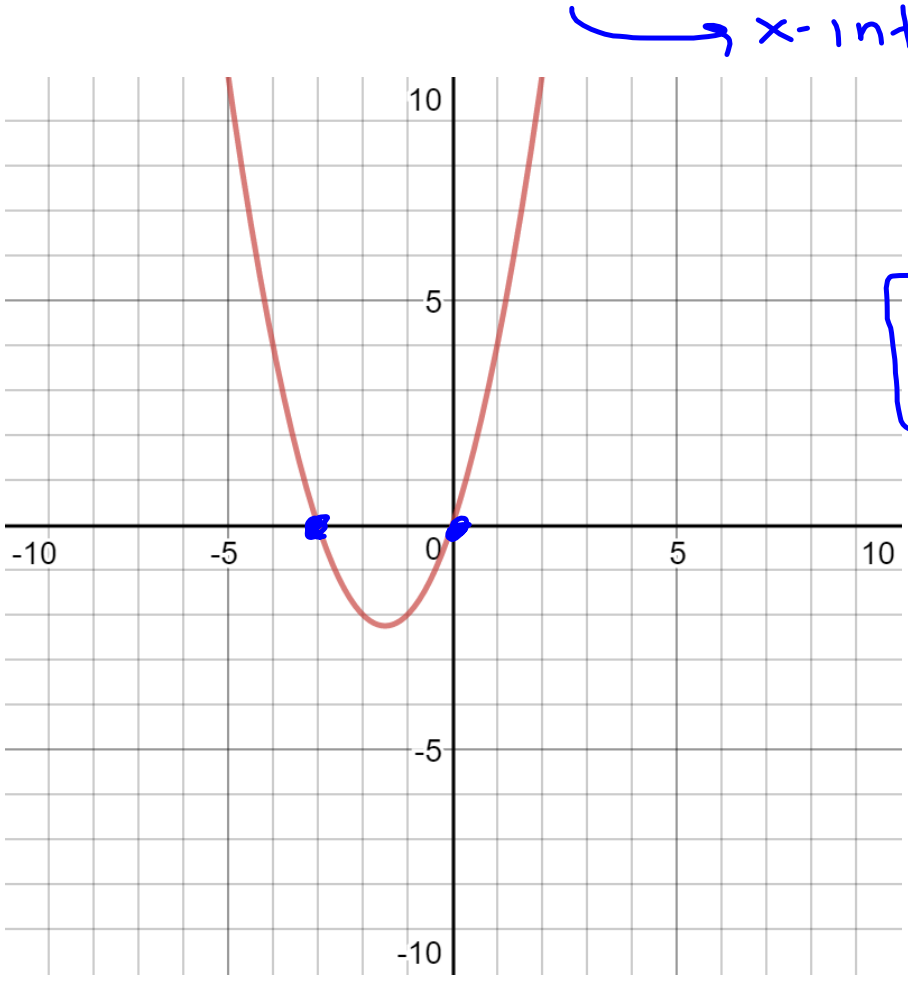
Linear

6) Label whether this is exponential, linear, or quadratic.



expon.

7) Estimate the solutions:



8. Graph using a table of values. Include at least 3 points in your table.

x	y
2	-4
0	-12
4	-12

$$y = -2x^2 + 8x - 12$$

$a = -2$

$b = 8$

$c = -12$

$y = -2(2)^2 + 8(2) - 12$

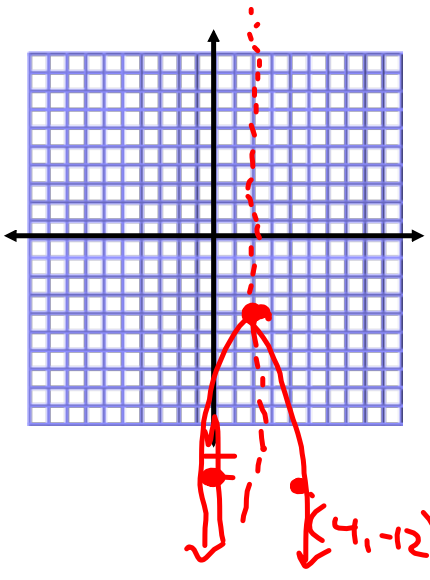
$-2(4)$

$-8 + 16 - 12$

$8 - 12$

-4

$x = \frac{-b}{2a} = \frac{-8}{-4}$



Axis of Symmetry: $x = 2$

Vertex: (2,-4)

Opens: down

Minimum or Maximum? -4

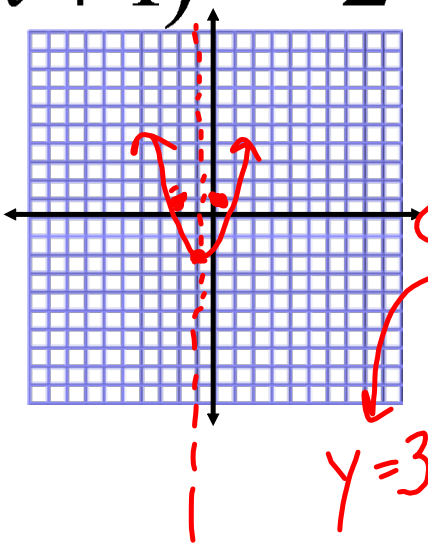
Y-Intercept: (0,-12)

Domain: $\mathbb{R}$

Range: $y \leq -4$

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

x	y
-1	-2
0	1
-2	1



Axis of Symmetry: $x = -1$

Vertex: $(-1, -2)$

Opens: up

Minimum or Maximum? Min

Y-Intercept: $(0, 1)$

Domain: $\mathbb{R}$

Range: $y \geq -2$

$y = 3(0+1)^2 - 2$

$3(1) - 2$

$3 - 2$

1

10)

Solve using the quadratic formula.

Round to the nearest hundredth if necessary.

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$f(x) = x^2 - 2x - 15$$

$a = 1$

$b = -2$

$c = -15$

$$x = \frac{2 \pm \sqrt{4 - 4 \cdot 1 \cdot -15}}{2}$$

4 + 60

$$x = \frac{2 \pm \sqrt{64}}{2}$$

$$x = \frac{2 \pm 8}{2}$$

$$\frac{2+8}{2} \quad \frac{2-8}{2}$$

$x = 5, -3$

11)

Solve using the quadratic formula.

Round to the nearest hundredth if necessary.

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

$-3 \qquad -3$

$0 = -x^2 + 5x - 3$

$a = -1$

$b = 5$

$c = -3$

$$x = \frac{-5 \pm \sqrt{25 - 4(-1)(-3)}}{-2}$$

25-12

$$x = \frac{-5 \pm \sqrt{13}}{-2}$$

$$\frac{-5+\sqrt{13}}{-2} \qquad \frac{-5-\sqrt{13}}{-2}$$

4.30 .70

Without graphing the function, describe how the graph will compare/contrast with $f(x) = x^2$. (Hint* include information about shape, vertex, and the direction it opens)

12. $g(x) = \frac{1}{2}x^2 + 8$

-1 to 1
fatter
up 8

13. $h(x) = -4x^2 - 2$

reflect over x axis
down
down 2
Skinnier

Solve the quadratic using any method.

Options:

1. Factoring

2. Square Roots

3. Quadratic Formula

13. $3(w-4)^2 = 15$

$\frac{3(w-4)^2}{3} = \frac{15}{3}$

$\sqrt{(w-4)^2} = \sqrt{5}$

$w - 4 = \pm\sqrt{5}$

$+4 \quad +4$

$w = 4 \pm \sqrt{5}$

$4+\sqrt{5}$ $\quad$ $4-\sqrt{5}$

6.24 $\quad$ 1.76

Solve the quadratic using any method.

Options:

1. Factoring

2. Square Roots

3. Quadratic Formula

$$\frac{3}{4}(x-7)^2 = 9$$

$\frac{4}{3}$ $\frac{4}{3}$

$$\sqrt{(x-7)^2} = \sqrt{12}$$

$$x - 7 = \pm\sqrt{12}$$

$$+7 \quad +7$$

$$x = 7 \pm \sqrt{12}$$

$7+\sqrt{12}$ $7-\sqrt{12}$

10.46 3.54

Convert to vertex form by completing the square. Then, name the vertex.

15. $y = x^2 - 10x + 4$

$x^2 - 10x + 25 + 4 - 25$

$y = (x-5)^2 - 21$

$V = (5, -21)$

Convert to vertex form by completing the square. Then, name the vertex.

16. $y = 4x^2 + 32x - 8$

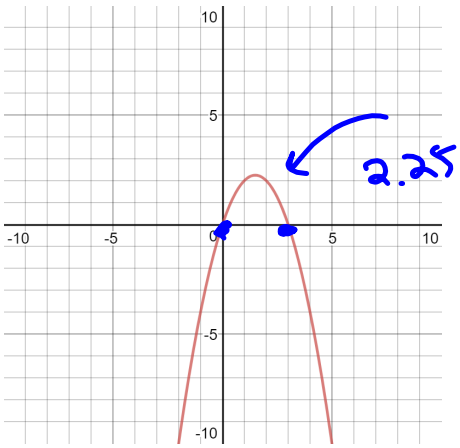
$4x^2 + 32x + 64 - 8 - 64$

$4(x^2 + 8x + 16)$

$y = 4(x+4)^2 - 72$

$(-4, -72)$

17)



a) For what values of x is the function positive? $0 < x < 3$

b) What is the maximum value of the function? 2.25

c) What are the roots of the function? $x = 3$, $x = 0$