Date: Mar 3

Bellringer: Solve.

1. $2x^2 = 11x - 12$ $x = 4, \frac{3}{2}$

2. $x^3 - 24x = 5x^2$ $0, 8, -3$

3. $2t^2 + 7t = 15$

$2t^2 + 7t - 15 = 0$

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

$\frac{3}{2}$ -5

Learning Target: You can graph quadratic functions.

$y = ax^2 + bx + c$

Examples of quadratic functions:

1. $y = x^2$
2. $y = x^2 - 2x - 3$
3. $y = x^2 - 8x$
4. $y = 6x^2 - 2x + 1$
5. $y = x^2 + 3$

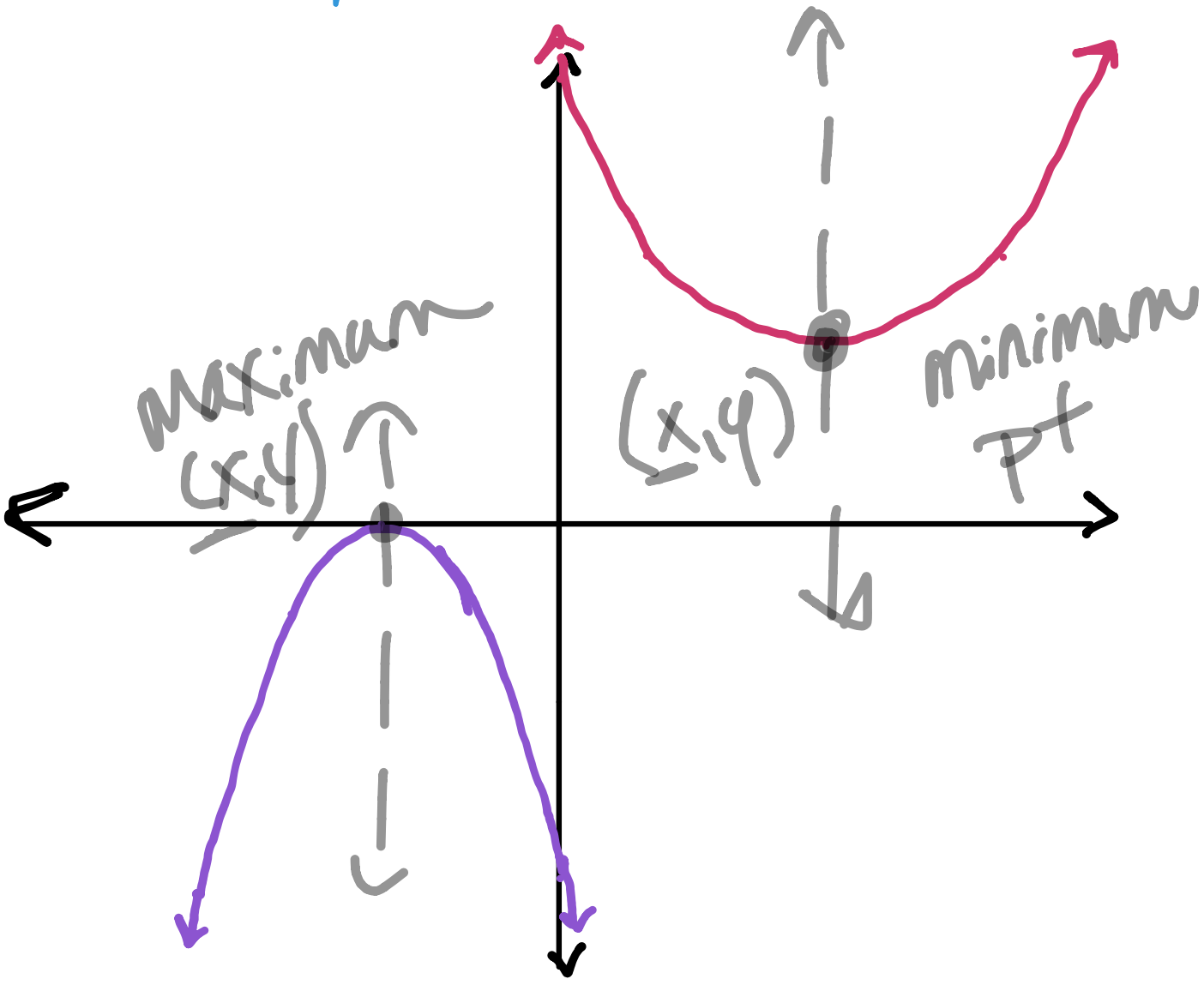
What do these quadratic functions have in common?

largest exponent is 2

Quadratic functions are in the form:

$y = ax^2 + bx + c$

The graph of a quadratic function is called a parabola.



The equation for the axis of symmetry:

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

Find the axis of symmetry and the vertex of the function.

$ax^2 + bx + c$

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

$a = 3$

$b = 6$

$c = -2$

axis $x = -1$

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

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

$x = \frac{-6}{6}$

Vertex $(-1, -5)$

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

$y = 3(-1)^2 + 6(-1) - 2$

$y = 3 - 6 - 2$

$y = -5$

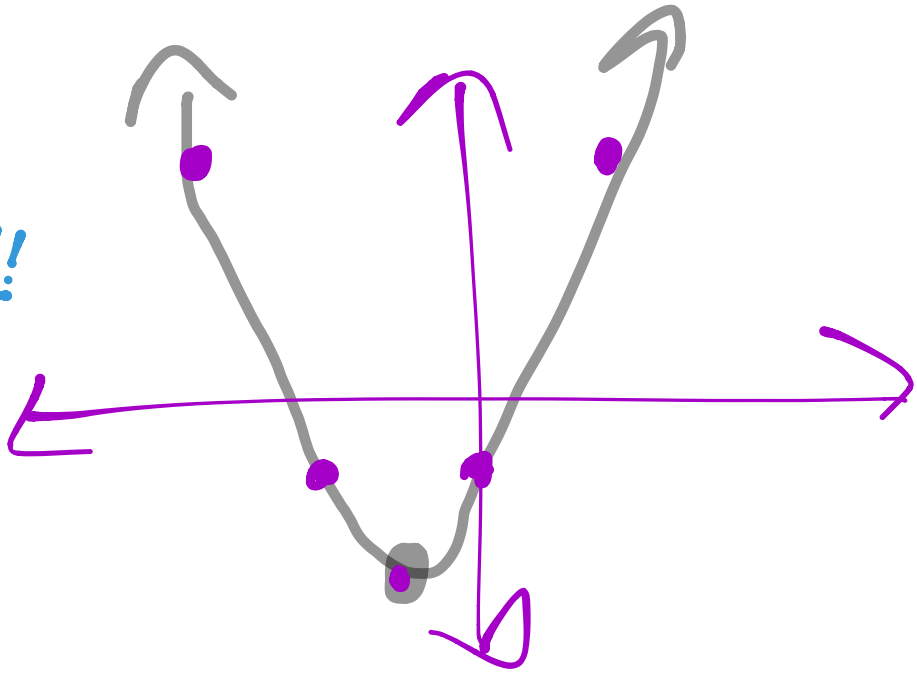
Make a table of values, graph the function, and find the domain and range

X	$y = 3x^2 + 6x - 2$	y
-3	$3(-3)^2 + 6(-3) - 2$ $3(9) - 18 - 2$	7
-2	$3(-2)^2 + 6(-2) - 2$ $12 - 12 - 2$	-2
-1		-5
0	$0 + 0 - 2$	-2 ✓
1	$3(1)^2 + 6(1) - 2$	7

Domain: All real numbers (DARN)

Range: $y \geq -5$

GRAPH IT!!



minimum

Find the axis of symmetry and the vertex of the function.

$$y = -x^2 + 6x + 4$$

axis $x = 3$

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

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

$$x = 3$$

vertex $(3, 13)$

$$y = -x^2 + 6x + 4$$

$$y = -1(3)^2 + 6(3) + 4$$

$$y = -9 + 18 + 4$$

$$y = 13$$

Make a table of values, graph the function, and find the domain and range

X	$y = -x^2 + 6x + 4$	y
1	$-1+6+4$	9
2	$-4+12+4$	12
3		13
4	$-16+24+4$	12
5	$-25+30+4$	9

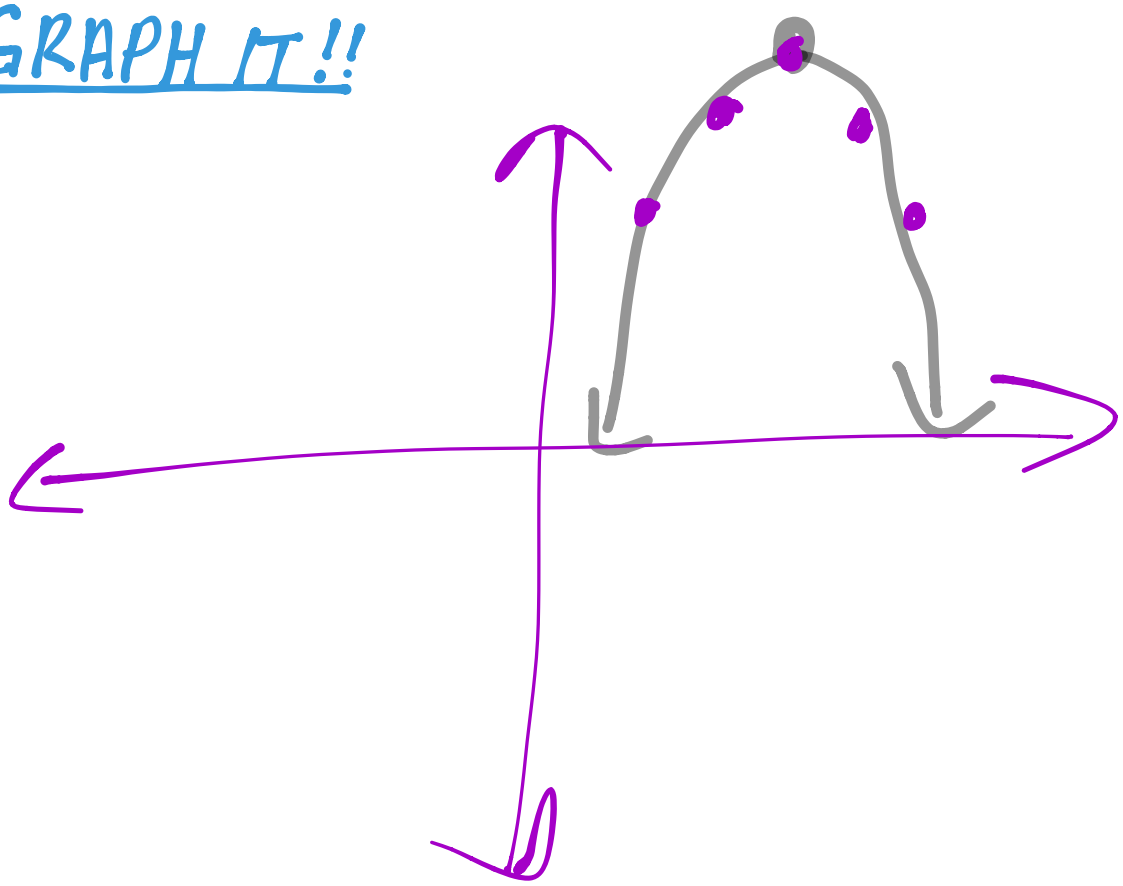
Domain

Range $y \leq 13$

D: $\mathbb{R}$

maximum

GRAPH IT!!



Look at page 549 in your book.

#5. Vertex: $(-1, 5)$

axis: $x = -1$

y-intercept = 3

#7. Vertex: $(-2, -12)$

axis: $x = -2$

y-int $= -4$

#9. $y = -3x^2 + 6x - 1$

y-intercept: -1

axis: $x = 1$

Vertex: $(1, 2)$

axis

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

$x = \frac{-6}{-6}$

$x = 1$

$y = -3(1)^2 + 6(1) - 1$

$y = -3 + 6 - 1 = 2$

#15. $y = -3x^2 + 6x + 3$

axis

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

a. max

b. 6

c.

$x = \frac{-6}{-6} = 1$

$y = -3(1) + 6(1) + 3$

$y = 6$

Assignment:

p549 #2-20 E