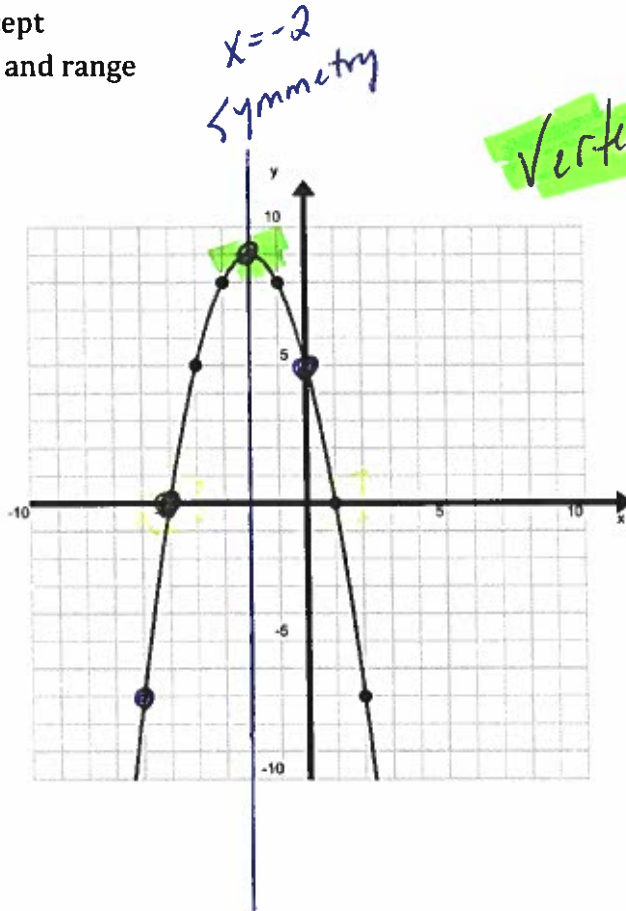


Key

Math 20-2 Quadratic Function Properties – part two:

1. Given the graph of the function:

- find the vertex
- sketch in the axis of symmetry and write the equation for the axis of symmetry
- plot and identify 3 other points on the graph using the property of symmetry
- find the x – intercepts
- find the y – intercept
- write the domain and range



Vertex $(-2, 9)$

Points $(0, 5)$
 $(-5, 0)$
 $(-6, -7)$

X-intercepts (zeros)
 $(-5, 0)$ and $(1, 0)$

Y-intercept
 $(0, 5)$

Domain: all x-values, $x \in \mathbb{R}$

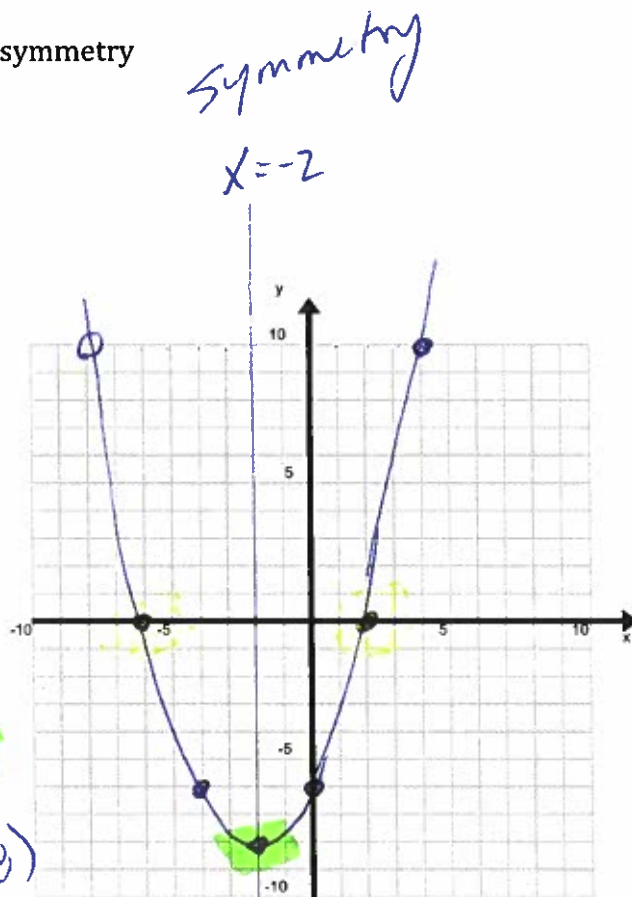
Range: 9 or less, $y \leq 9$

2. Given the equation of the quadratic function:

- find points to plot using a mapping diagram and/or a table of values
- find the x - intercepts
- find the y - intercept
- find the vertex
- write the equation for the axis of symmetry
- write the domain and range

$$y = \frac{1}{2}x^2 + 2x - 6$$

X	Y
-6	0
-4	-6
-2	-8
0	-6
2	0
4	10
6	24



Vertex
 $(-2, -8)$

x-intercepts (zeros)
 $(-6, 0)$ and $(2, 0)$

y-intercept
 $(0, -6)$

Domain: $x \in \mathbb{R}$

Range: -8 or larger
 $y \geq -8$

3. Find the quadratic equation [use regression skills] and draw the graph for the following:

X	Y
-3	0
-2	-2
0	0
1	4

a) Equation:

$$y = ax^2 + bx + c$$

$$a = 1$$

$$b = 3$$

$$c = 0$$

$$y = x^2 + 3x + 0$$

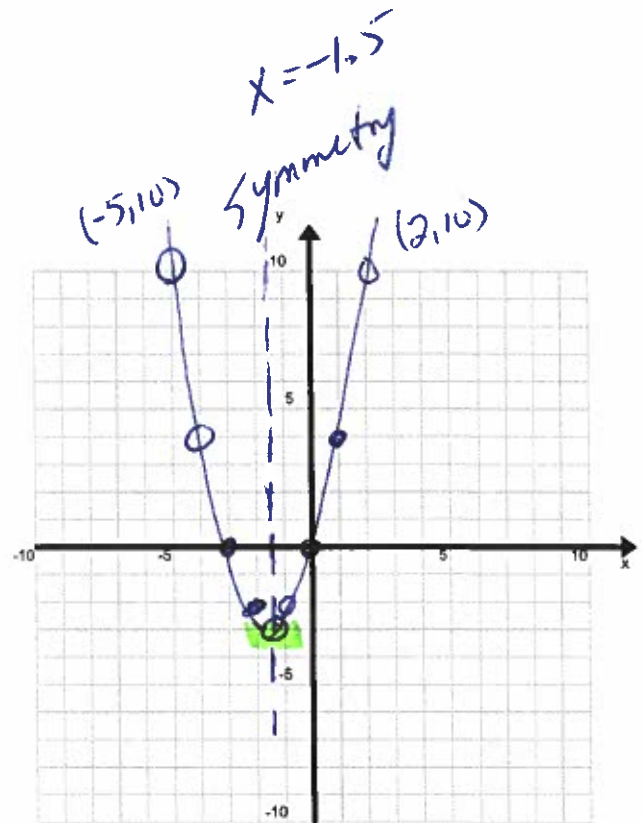
b) Plot the given points, plot at least 3 more points and draw the graph.

$(-3, 4)$
 $(-1, -2)$

c) Find the vertex.

Minimum

$(-1.5, -2.25)$

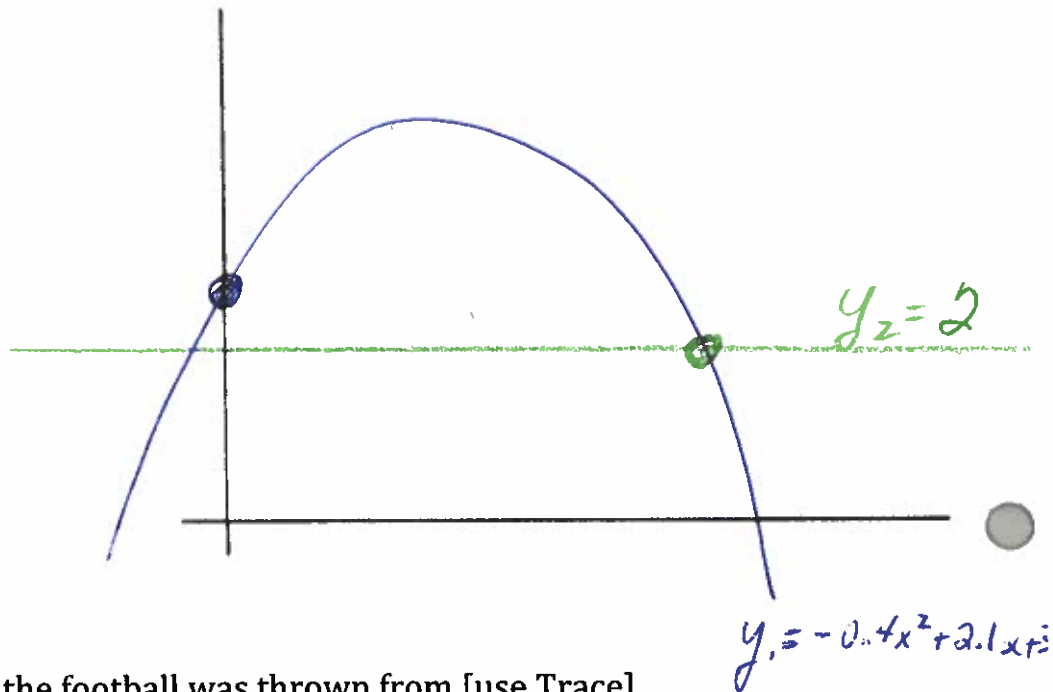


4. A football player stands on the top of the bleachers and throws the football towards the field. The height of the football is given by the equation:
 $h = -0.4t^2 + 2.1t + 3.25$, where t is the time in seconds and h is the height of the football in metres.

a) Sketch the path of the football using the window:

X: [-2,8,1]

Y: [-2,8,1]



b) Find the height the football was thrown from [use Trace].

$x=0$ $y=3.25$ 3.25 m

c) Find the maximum height of the football [use Maximum].

$x=2.62$ $y=6.01$ 6.0 m

d) Find how long the football is in the air [use Zero].

$x=6.5$ $y=0$ 6.5 seconds

e) Find when the football has a height of 2.0 metres [use Intersect].

$x=5.79$ $y=2$ 5.8 seconds