

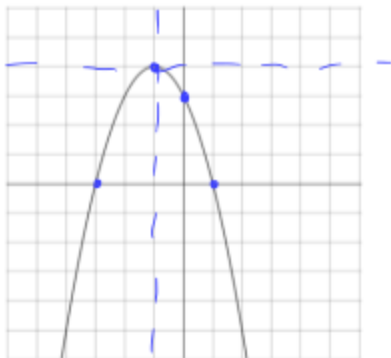
Pre-Calculus 11: Graphing Quadratics Quiz

Full credit will only be awarded for all work shown in a neat and organized manner.

For each graph below, identify the:

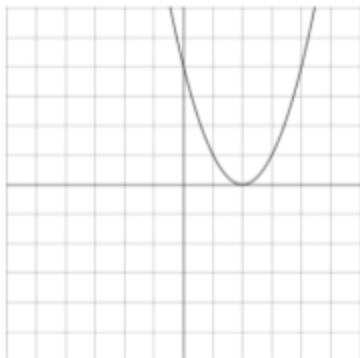
- a) y-intercept b) x-intercept(s) c) axis of symmetry d) vertex e) range

1.



- a) (0, 3)
 b) (-3, 0), (1, 0)
 c) $x = -1$
 d) (-1, 4)
 e) $y \leq 4$

2.



- a) (0, 4)
 b) (2, 0)
 c) $x = 2$
 d) (2, 0)
 e) $y \geq 0$

3. A quadratic can be described with the equation: $f(x) = -2(x + 4)^2 - 5$

DESCRIBE how the graph would change in appearance if we changed $f(x)$ to:

a) $g(x) = \frac{1}{2}(x + 4)^2 - 5$

- ① gets wider: $2 \rightarrow \frac{1}{2}$
 ② flips from downwards to upwards:
 $\ominus \rightarrow \oplus$

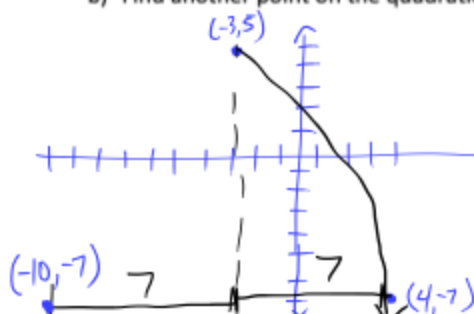
b) $g(x) = -2(x + 8)^2 + 2$

- vertex shifts from $(-4, -5)$ to $(-8, 2)$
 ① shift left by 4
 ② shift up by 7

4. A quadratic function has the vertex $(-3, 5)$ and passes through the point $(4, -7)$.

a) Does the parabola open upwards or downwards? (**EXPLAIN** your answer)

b) Find another point on the quadratic function



a) from picture, the parabola opens downwards

b) from picture, $(-10, -7)$

For each quadratic below, identify:

- a) y-intercept b) x-intercept(s) c) vertex d) range

5. $f(x) = -4x^2 + 4x + 15$

d) $a < 0$, opens down

a) $f(0) = -4(0)^2 + 4(0) + 15 = 15$

b) $f(x) = 0 = -(4x^2 - 4x - 15)$ $\begin{array}{r} \otimes 60 \mid (-10, 6) \\ \oplus -4 \mid -4 \end{array}$

$= -(4x^2 - 10x + 6x - 15)$
 $= -(2x(2x - 5) + 3(2x - 5)) = -(2x + 3)(2x - 5)$

- a) $(0, 15)$
 b) $(-\frac{3}{2}, 0), (\frac{5}{2}, 0)$

$x_1 = -\frac{3}{2}$ $x_2 = \frac{5}{2}$

- c) $(\frac{1}{2}, 16)$
 d) $y \leq 16$

c) x value vertex $= \frac{-\frac{3}{2} + \frac{5}{2}}{2} = \frac{1}{2}$ y value vertex $= -4(\frac{1}{2})^2 + 4(\frac{1}{2}) + 15 = -4(\frac{1}{4}) + 4(\frac{1}{2}) + 15 = 16$

6. $f(x) = \frac{1}{9}(x+3)^2 + 1$

f) $f(0) = \frac{1}{9}(0+3)^2 + 1 = \frac{1}{9}(3)^2 + 1 = 2$

d) $a > 0$, opens up

g) $f(x) = 0 = \frac{1}{9}(x+3)^2 + 1$

$-1 = \frac{1}{9}(x+3)^2$

$-9 = (x+3)^2$ Cannot Square Root
 \therefore No x-ints

- a) $(0, 2)$
 b) None
 c) $(-3, 1)$
 d) $y \geq 1$

c) $\frac{1}{9}(x+3)^2 + 1$ $h = -3$ $(-3, 1)$
 $a(x-h)^2 + k$ $k = 1$