

Name: _____

$$f(x) = -2(x - 5)^2 + 3$$

\uparrow \uparrow
 h k

$$g(x) = x^2 + 4x + 3$$

1. What is the vertex of $f(x)$? $(5, 3)$

2. What is the vertex of $g(x)$? $a=1$ $b=4$ $c=3$ $x=h = \frac{-b}{2a} = \frac{-4}{2(1)} = -2$
 $y=k = (-2)^2 + 4(-2) + 3 = -1$
 $(-2, -1)$

3. Which of your functions had the **greatest rate of increase** for $0 \leq x \leq 3$?

$f(x)$ $(0, -47)$ $(3, -5)$ $\frac{-5 - (-47)}{3 - 0} = \frac{42}{3} = 14$

$g(x)$ $(0, 3)$ $(3, 24)$ $\frac{24 - 3}{3 - 0} = \frac{21}{3} = 7$ $f(x)$ is greatest

4. Which of your functions had the **lowest vertex**?

$f(x) = (5, 3)$ $g(x) = (-2, -1)$
 $g(x)$ is lower

5. Which of your functions had the **highest y-intercept**?

$f(x)$ $(0, -47)$ $g(x)$ $(0, 3)$
 $g(x)$ is higher

6. Which of your functions had the **smallest rate of increase** for $-2 \leq x \leq 0$?

$f(x)$ $(-2, -95)$ $(0, -47)$ $\frac{-47 - (-95)}{0 - (-2)} = \frac{48}{2} = 24$

$g(x)$ $(-2, -1)$ $(0, 3)$ $\frac{3 - (-1)}{0 - (-2)} = \frac{4}{2} = 2$

$g(x)$ is smallest 18