

GRAPHING PIECEWISE FUNCTIONS (SAMPLE RESPONSES)

Graph each piecewise function and label the intercepts. Identify the domain and range. Write the intervals where the function is increasing, decreasing, and/or constant.

$$1) f(x) = \begin{cases} -(x+1)^2 + 9 & \text{if } -4 \leq x \leq 1 \\ -(x-2)^2 + 6 & \text{if } 1 < x \leq 4 \\ 2 & \text{if } x > 4 \end{cases}$$

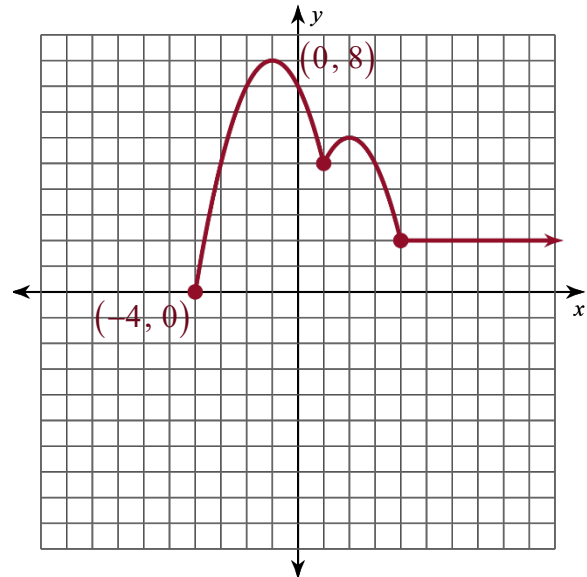
Domain: $\{x \mid x \in \mathbb{R}, x \geq -4\}$

Range: $\{y \mid y \in \mathbb{R}, 0 \leq y \leq 9\}$

increasing: $[-4, -1] \cup [1, 2]$

decreasing: $[-1, 1] \cup [2, 4]$

constant: $[4, \infty)$



$$2) g(x) = \begin{cases} 5 & \text{if } x < -2 \\ 2^x - 4 & \text{if } -2 \leq x \leq 3 \\ -2x + 14 & \text{if } x > 3 \end{cases}$$

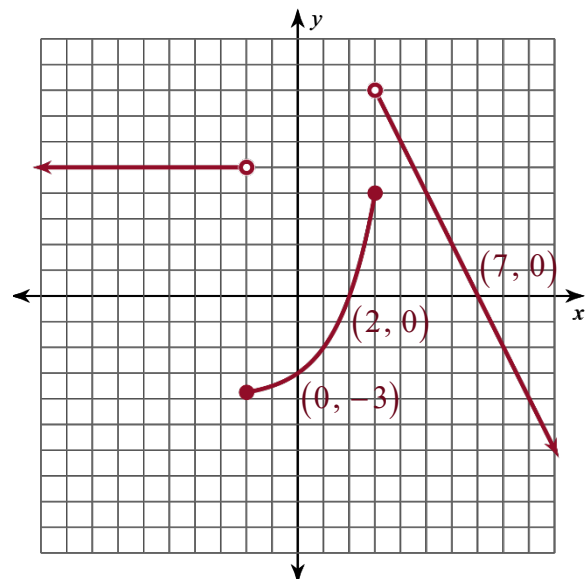
Domain: $\{x \mid x \in \mathbb{R}\}$

Range: $\{y \mid y \in \mathbb{R}, y < 8\}$

increasing: $[-2, 3]$

decreasing: $(3, \infty)$

constant: $(-\infty, -2)$



3) If $f(x)$ is a continuous function, and $g(x)$ is a discontinuous function. What do you think it means for a graph to be continuous? *A continuous function is something I can draw, from left to right, without picking up my pencil.*