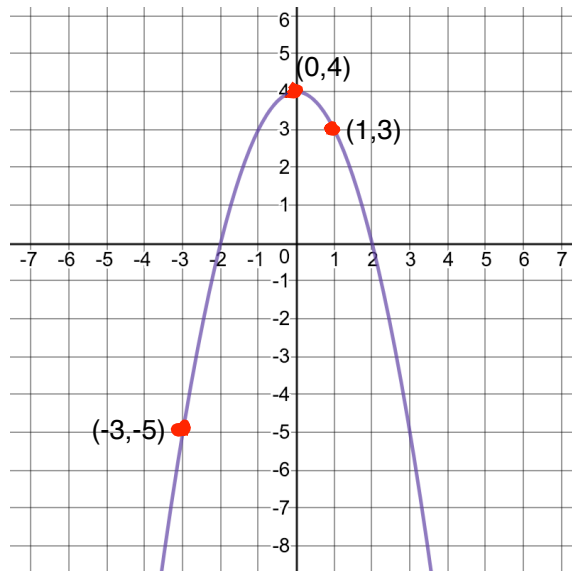


1. (6 points) Shown below is the graph of the function $f(x) = -x^2 + 4$:



- (a) Compute the following values of f (show your calculations), and label the corresponding points on the graph above:

Solution:

- $f(0) = -0^2 + 4 = 0 + 4 = 4$ (which means the point $(0, 4)$ is on the graph)
- $f(1) = -(1^2) + 4 = -1 + 4 = 3$ (so the point $(1, 3)$ is on the graph)
- $f(-3) = -(3^2) + 4 = -9 + 4 = -5$ (so the point $(-3, -5)$ is on the graph)

- (b) What is the domain of f ? What is the range of f ? For full credit, write the solutions in interval notation.

Solution:

- The domain of f is \mathbb{R} , i.e., all real numbers; in interval notation: $(-\infty, \infty)$
- Since the max value of $f(x)$ is $f(0) = 4$ the range of f is $(-\infty, 4]$

2. (4 points) Find the domain of each of the following functions. For full credit, write the solutions in interval notation.

(a)

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

Solution: The domain consists of all real numbers *except* $x = 2$, i.e., in interval notation: $(-\infty, 2) \cup (2, \infty)$

(b)

$$h(x) = \sqrt{x+1}$$

Solution: The domain consists of real numbers x such that $x + 1 \geq 0$, i.e., in $x \geq -1$. In interval notation: $[-1, \infty)$