

## Exercise 15

For the following exercises, find the domain, range, and all zeros/intercepts, if any, of the functions.

$$g(x) = \sqrt{8x - 1}$$

### Solution

$g(x)$  is a square root function, so the domain is the set of all  $x$  where the argument is nonnegative.

$$8x - 1 \geq 0$$

$$8x \geq 1$$

$$x \geq \frac{1}{8}$$

Therefore, the domain is  $\{x \mid x \geq 1/8\}$ . The square root yields a nonnegative number for any value of  $x$  in the domain, so the range is  $\{y \mid 0 \leq y < \infty\}$ . Find the zero now.

$$g(x) = \sqrt{8x - 1} = 0 \quad \Rightarrow \quad x = \frac{1}{8}$$

The one  $x$ -intercept is  $(1/8, 0)$ . Below is a graph of  $g(x)$  versus  $x$  to confirm these results.

