

Using the information you now have about the parent functions we looked at, determine the domain and range of each function.

Function	Notes	Parent Function	Domain	Range
$f(x) = 3x - 1$	no restrictions for domain & range of linear functions	$f(x) = x$	$\{x \in \mathbb{R}\}$	$\{y \in \mathbb{R}\}$
$g(x) = 12 - x$		$g(x) = x$	$\{x \in \mathbb{R}\}$	$\{y \in \mathbb{R}\}$
$h(x) = 2(x-1)^2 + 3$	no restriction on domain range depends on direction of opening and vertex	$h(x) = x^2$	$\{x \in \mathbb{R}\}$	$\{y \in \mathbb{R} \mid y \geq 3\}$
$j(x) = -4x^2 + 7$		$j(x) = x^2$	$\{x \in \mathbb{R}\}$	$\{y \in \mathbb{R} \mid y \leq 7\}$
$k(x) = \sqrt{2x}$	solve $2x \geq 0$ for domain	$k(x) = \sqrt{x}$	$\{x \in \mathbb{R} \mid x \geq 0\}$	$\{y \in \mathbb{R} \mid y \geq 0\}$
$p(x) = \sqrt{x+8}$	solve $x+8 \geq 0$	$p(x) = \sqrt{x}$	$\{x \in \mathbb{R} \mid x \geq -8\}$	$\{y \in \mathbb{R} \mid y \geq 0\}$
$q(x) = \sqrt{5-x}$	solve $5-x \geq 0$	$q(x) = \sqrt{x}$	$\{x \in \mathbb{R} \mid x \leq 5\}$	$\{y \in \mathbb{R} \mid y \geq 0\}$

Assignment:

$$\frac{2x \geq 0}{2} \quad \frac{x \geq 0}{2}$$

$$\frac{x+8 \geq 0}{-8} \quad \frac{-8}{-8} \quad x \geq -8$$

$$\frac{5-x \geq 0}{+x} \quad \frac{-x}{+x} \quad 5 \geq x \rightarrow x \leq 5$$

1. Determine the domain and range of each function.

a)  $f(x) = -3x + 8$

D: \_\_\_\_\_

R: \_\_\_\_\_

b)  $g(x) = 4x + 1$

D: \_\_\_\_\_

R: \_\_\_\_\_

c)  $h(x) = -0.5(x+3)^2 + 4$

D: \_\_\_\_\_

R: \_\_\_\_\_

d)  $h(x) = \frac{2}{3}(x-2)^2 - 5$

D: \_\_\_\_\_

R: \_\_\_\_\_

e)  $f(x) = \sqrt{x-1}$

D: \_\_\_\_\_

R: \_\_\_\_\_

f)  $p(x) = \sqrt{5-x}$

D: \_\_\_\_\_

R: \_\_\_\_\_

g)  $q(x) = 11 - \frac{5}{2}x$

D: \_\_\_\_\_

R: \_\_\_\_\_

h)  $k(x) = -2x^2 - 5$

D: \_\_\_\_\_

R: \_\_\_\_\_

i)  $r(x) = \sqrt{x+2}$

D: \_\_\_\_\_

R: \_\_\_\_\_

2. A ball is thrown upward from the roof of a 25 m building. The ball reaches a height of 45 m above the ground after 2 s and hits the ground 5 s after being thrown.

a) Sketch a graph that shows the height of the ball as a function of time.

b) State the domain and range. D: \_\_\_\_\_ R: \_\_\_\_\_