

Determine the domain of the function.

what is the domain of a function?

the set of allowable inputs
for which the function has
a defined numerical value.

the inputs are most commonly
denoted by x .

a) $f(x) = \sqrt{4-x} \cdot \sqrt{x+1}$

$$4-x \geq 0$$

$$x+1 \geq 0$$

$$x \leq 4$$

$$x \geq -1$$

$x \in \langle -1, 4 \rangle \rightarrow$ the intersection.

b) $f(x) = \frac{\sqrt{x-1}}{x^2-2} + \frac{1}{x^2-9}$

$$x-1 \geq 0$$

$$x^2-2 \neq 0$$

$$x^2-9 \neq 0$$

$$x \geq 1$$

$$(x-\sqrt{2})(x+\sqrt{2}) \neq 0$$

$$(x-3)(x+3) \neq 0$$

$$x \neq \sqrt{2}, x \neq -\sqrt{2}$$

$$x \neq 3, x \neq -3$$

$x \in \langle 1, \sqrt{2} \rangle \cup (\sqrt{2}, 3) \cup (3, +\infty) \rightarrow$ the intersection.

c) $f(x) = \sqrt{-x} - \sqrt{2-x}$

$$-x \geq 0$$

$$2-x \geq 0$$

$$x \leq 0$$

$$x \leq 2$$

$x \in (-\infty, 0] \rightarrow$ the intersection.

d) $f(x) = \frac{\sqrt{3-0.5x}}{\sqrt{4+x}} - \frac{3}{|x|-3}$

$$3-0.5x \geq 0$$

$$4+x > 0$$

$$|x|-3 \neq 0$$

$$0.5x \leq 3 / : 2$$

$$x > -4$$

$$|x| \neq 3$$

$$x \leq 6$$

$$x \neq -3, x \neq 3$$

note that

$$|3| = 3$$

$$|-3| = 3$$

$x \in (-4, -3) \cup (-3, 3) \cup (3, 6] \rightarrow$ the intersection.