

Domain

The Domain of a function is all possible x -values for which the function is true.

$$f(x) = 3x - 7$$

$$\text{Domain: } \mathbb{R}, (-\infty, +\infty)$$

$$g(x) = \sqrt{x}$$

$$\text{Domain: } [0, +\infty)$$

$$h(x) = \frac{1}{x^2 - 4x + 3} \quad * \text{Can't divide by } 0$$

AC method \rightarrow $x^2 - 4x + 3 \neq 0$
 $(x-1)(x-3) \neq 0$ } Solve by factoring

$$\begin{array}{r} x-1 \neq 0 \\ \hline +1 \quad +1 \\ \hline x \neq 1 \end{array}$$

$$\begin{array}{r} x-3 \neq 0 \\ \hline +3 \quad +3 \\ \hline x \neq 3 \end{array}$$

$$\text{Domain: } x \neq 1, x \neq 3$$

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

Ignore

$$\begin{array}{r} x-4 \geq 0 \\ \hline +4 \quad +4 \\ \hline x \geq 4 \end{array}$$

* Can't be negative

$$\text{Domain: } x \geq 4, [4, +\infty)$$

$$g(x) = \sqrt{x-3} + \sqrt{2-x}$$

$$\begin{array}{r} x-3 \geq 0 \\ \hline +3 \quad +3 \\ \hline x \geq 3 \end{array}$$

$$\begin{array}{r} 2-x \geq 0 \\ \hline -2 \quad -2 \\ \hline -x \geq -2 \\ \hline -1 \quad -1 \end{array}$$

Sign
switch

$$x \leq 2$$

Domain:

$$x \geq 3 \text{ or } x \leq 2$$

$$(-\infty, 2] \cup [3, +\infty)$$