

## Functions and Substitution

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A function is made up of a rule and a domain.

E.g. Rule:  $f(x) = x^2 + 2x + 4$

Domain:  $x > 0$

Rule:  $y = \frac{1}{x}$

Domain:  $x$  is any real number except for 0

When a domain for a function is not specified we normally assume that the domain takes all real numbers (R).

To find values for a function, for a given value of  $x$  we simply substitute the value of  $x$  into the given rule.

E.g. Rule:  $f(x) = x^3 + 4x^2 + x + 2$  Domain value:  $x = 2$

$$f(2) = 2^3 + (4 \cdot 2^2) + 2 + 2 = 28$$

E.g. Rule:  $y = 2x + \frac{1}{2}x + 10$  Domain value:  $x = 4$

$$y = 2 \cdot 4 + \frac{4}{2} + 10 \quad y = 20$$