

Calculus
Warmup

Find the domain of the functions below

1) $g(x) = \frac{3x-1}{2x^2 + 11x + 15}$

2) $h(x) = \frac{6-x}{\sqrt{3-x}}$

3) Find the difference quotient $\frac{f(x) - f(2)}{x - 2}$ for the function $f(x) = x^3 + 5$.

4) Find the difference quotient $\frac{g(1+h) - g(1)}{1+h-1}$ for the function $g(x) = (3 - 2x)^2$.

5)

$$f(x) = \begin{cases} -2|x+3| - 1 & \text{if } x \in [-5, -2) \\ -3 - \sqrt{16 - (x+1)^2} & \text{if } x \in [-2, 2) \\ \frac{2}{3}(x-5) + 3 & \text{if } x \in (2, \infty) \end{cases}$$

- a) Draw a graph of the function.
 - b) State the domain and range of f(x).
- 6) Write a piecewise function for the graph below, which consists of line segments, a semi-circle and an absolute value graph.