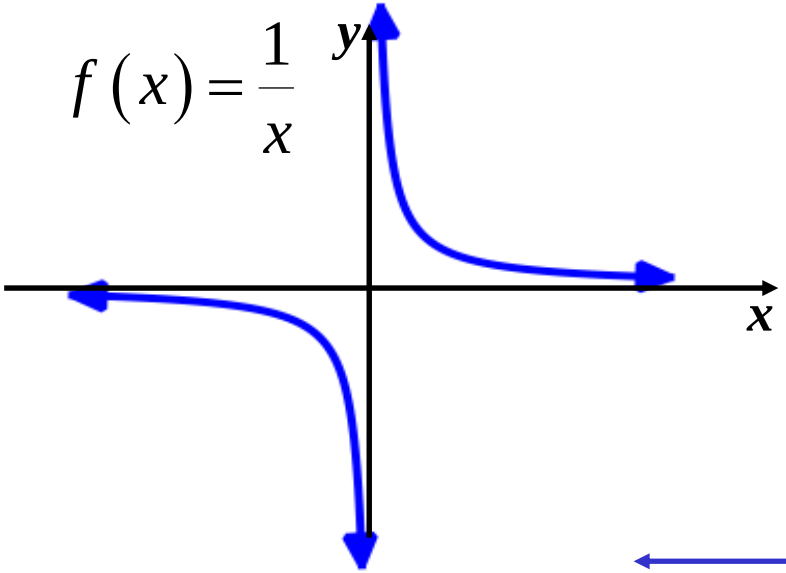
Continuity

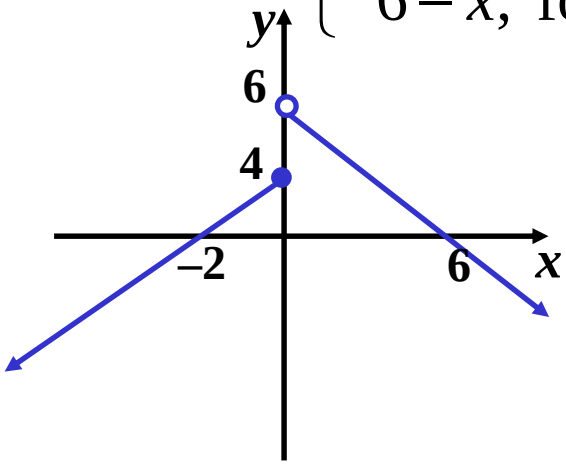
A graph with no vertical asymptotes, point discontinuities or any other gaps in the domain or range is said to be **continuous**.

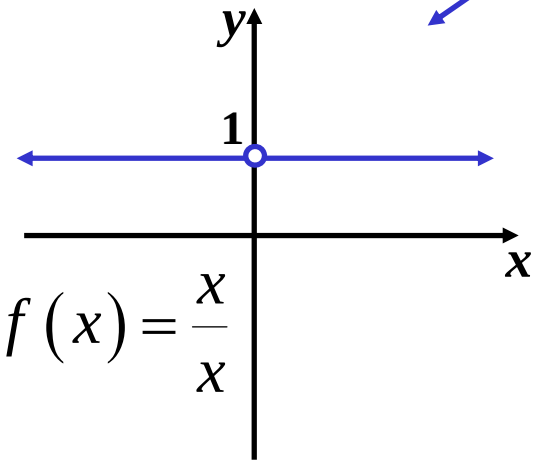
some examples of discontinuous graphs

$$f(x) = \frac{1}{x}$$



$$f(x) = \begin{cases} 2x+4, & \text{for } x \le 0 \\ 6-x, & \text{for } x > 0 \end{cases}$$

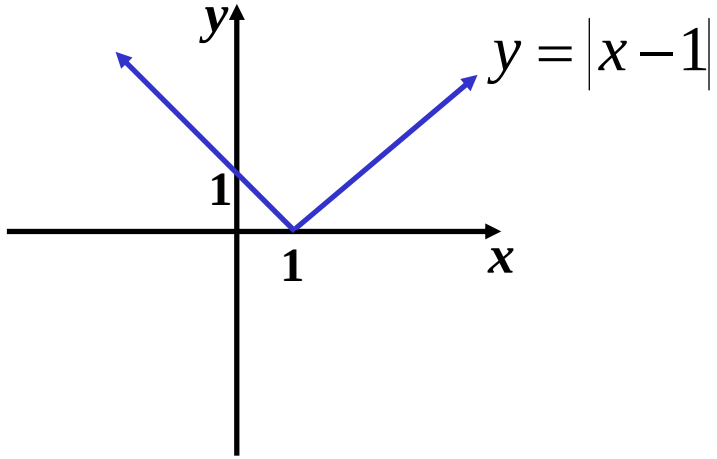




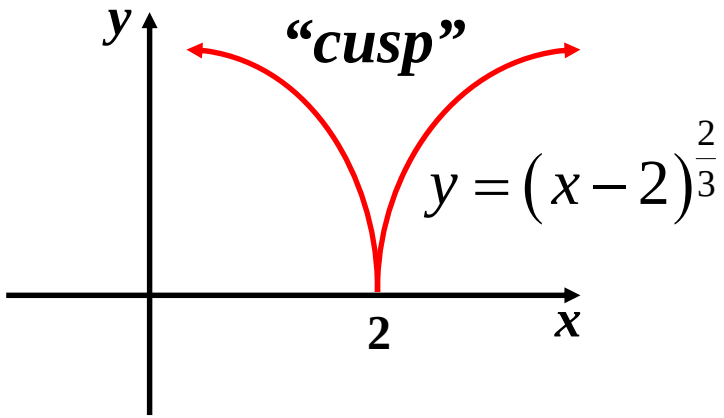
$$f(x) = \frac{x}{x}$$

Differentiability

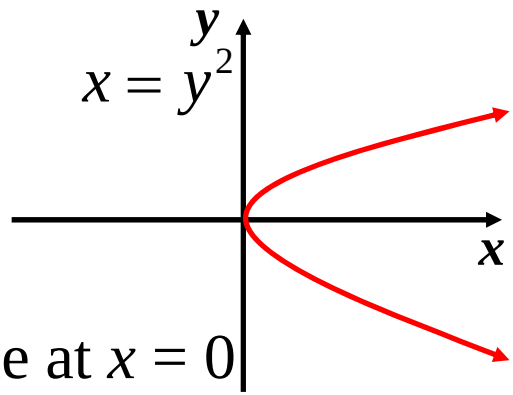
A function is differentiable at a point if the curve is **smooth continuous** and the tangent is not vertical at that point.



not differentiable at $x = 1$



not differentiable at $x = 2$



not differentiable at $x = 0$

Exercise 9K; 1, 2, 4c, 6ad, 8, 9

Exercise 9L;1, 2, 4, 5, 8, 10