

Find all asymptotes for the function  $f(x) = \frac{2x-1}{x+3}$  and sketch the graph.

1. Since the denominator is equal to 0 when  $x = -3$ , the line  $x = -3$  is a vertical asymptote.

2. Note that  $f(x) = \frac{2x-1}{x+3} = \frac{\frac{2x-1}{x}}{\frac{x+3}{x}} = \frac{2 - \frac{1}{x}}{1 + \frac{3}{x}}$ .

3. When  $x$  is a very large positive number or a very large negative number,

$f(x) = \frac{2 - \frac{1}{x}}{1 + \frac{3}{x}}$  is nearly equal to 2. So  $y = 2$  is a horizontal asymptote.

