From basic principles, directly from the definition of a derivative, that is, using either

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$
 or $f'(x) = \lim_{x \to a} \frac{f(x) - f(a)}{h}$

find the derivative of $f(x) = \frac{2}{3x-1}$

Solution:

$$\frac{d}{dx}f(x) = \lim_{h \to 0} \frac{\frac{2}{3(x+h)-1} - \frac{2}{3x-1}}{h}$$

$$= \lim_{h \to 0} \frac{\frac{2}{3x+3h-1} - \frac{2}{3x-1}}{h}$$

$$= \lim_{h \to 0} \frac{2(3x-1)-2(3x+3h-1)}{h(3x+3h-1)(3x-1)}$$

$$= \lim_{h \to 0} \frac{6x-2-6x-6h+2}{h(3x+3h-1)(3x-1)}$$

$$= \lim_{h \to 0} \frac{-6h}{h(3x+3h-1)(3x-1)}$$

$$= \lim_{h \to 0} \frac{-6}{(3x+3h-1)(3x-1)}$$

$$= \frac{-6}{(3x+3(0)-1)(3x-1)}$$

$$= \frac{-6}{(3x-1)^2}$$