

## DERIVATA DEL QUOZIENTE

$$y = \frac{f(x)}{g(x)} \quad D\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$D\left(\frac{f(x)}{g(x)}\right) = \lim_{h \rightarrow 0} \frac{\frac{f(x+h)}{g(x+h)} - \frac{f(x)}{g(x)}}{h} =$$
$$= \lim_{h \rightarrow 0} \frac{f(x+h)g(x) - f(x)g(x+h)}{h g(x+h)g(x)} =$$

aggiungo e tolgo  $f(x)g(x)$

$$= \lim_{h \rightarrow 0} \frac{f(x+h)g(x) - f(x)g(x+h) + f(x)g(x) - f(x)g(x)}{h g(x+h)g(x)} =$$
$$= \lim_{h \rightarrow 0} \frac{[f(x+h)g(x) - f(x)g(x)] + [f(x)g(x) - f(x)g(x+h)]}{h g(x+h)g(x)} =$$
$$= \lim_{h \rightarrow 0} \left[ \frac{g(x)(f(x+h) - f(x))}{h g(x+h)g(x)} - \frac{f(x)(g(x+h) - g(x))}{h g(x+h)g(x)} \right]$$
$$= \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

$$D\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

ESEMPIO

$$f(x) = \frac{3x}{2x+1}$$

$$D\left(\frac{3x}{2x+1}\right) = \frac{D(3x)(2x+1) - 3x D(2x+1)}{(2x+1)^2} =$$
$$= \frac{3(2x+1) - 3x \cdot 2}{(2x+1)^2} = \frac{6x+3-6x}{(2x+1)^2} =$$
$$= \frac{3}{(2x+1)^2}$$