9.5) The quotient rule

Worked example	Your turn
Differentiate with respect to x: $$y = \frac{3x}{5x - 2}$$	Differentiate with respect to x: $$y = \frac{x}{2x + 5}$$ $$\frac{dy}{dx} = \frac{5}{(2x + 5)^2}$$

Worked example	Your turn
Differentiate with respect to x: $$y = \frac{x^2}{\ln 5x}$$	Differentiate with respect to x: $$y = \frac{x^3}{\ln 3x}$$ $$\frac{dy}{dx} = \frac{x^2(3\ln 3x - 1)}{(\ln 3x)^2}$$
$$y = \frac{\ln 4x}{x^4}$$	

Worked example	Your turn
Differentiate with respect to x: $$y = \frac{\cos 3x}{x^4}$$	Differentiate with respect to x: $$y = \frac{\sin 4x}{x^3}$$ $$\frac{dy}{dx} = \frac{4x \cos 4x - 3 \sin 4x}{x^4}$$

$$f(x) = \frac{x^4}{\cos 3x}$$

Worked example	Your turn
Find the stationary point of $$y = \frac{\cos x}{e^{3x}}, \ 0 < x < \pi$$	Find the stationary point of $$y = \frac{\sin x}{e^{2x}}, \ 0 < x < \pi$$ $$(0.464, 0.177) \ (3 \text{ dp})$$

Worked example	Your turn
Find the equation of the tangent to the curve $y = \dfrac{e^{\frac{1}{4}x}}{x}$ at the point $(4, \frac{1}{4}e)$	Find the equation of the tangent to the curve $y = \dfrac{e^{\frac{1}{2}x}}{x}$ at the point $(2, \frac{1}{2}e)$

$$y = \frac{1}{2}e$$