The Math Dugout - Worksheet

PRODUCT & QUOTIENT RULE

Useful Videos - https://youtu.be/KkdgTY1FH7A

EXERCISE 1 – Use the "product rule" formula below to find the derivatives of the following functions.

$$\frac{d}{dx}uv = uv' + vu'$$

- (a) $f(x) = 3x \cdot 7x^2$
- (b) $g(x) = sin(6x^2) \cdot 2x^2$
- (c) $f(x) = cos(x) \cdot (3x^2 + 4x^3)$
- (d) $g(x) = 2e^x \cdot 4x^2$
- (e) $f(x) = -2sin(2x) \cdot 7x^3$
- (f) $g(x) = -sin(2x^5 + 3x) \cdot cos(e^x)$

EXERCISE 2 – Use the "quotient rule" formula below to find the derivatives of the following functions.

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{vu' - uv'}{v^2}$$

- (a) $f(x) = \frac{\sin(x)}{e^x}$
- (b) $g(x) = \frac{\cos(3x)}{4e^{2x}}$
- (c) $f(x) = \frac{2e^x}{3\sin(2x)}$
- (d) $g(x) = \frac{3e^{x^2}}{\cos(2x)}$
- (e) $f(x) = \frac{4x^2}{3\cos(2x+1)}$

EXERCISE 3 – Use the formulas above to find the derivative of the following function. (Hint: trig identity!)

- (a) $f(x) = tan(2x)$