

$$(uv)' = uv' + vu' \quad dy/dx = x^3$$

$$(\cos x) \times \sin x (3x^2)$$

QUOTIENT RULE

This is a special rule for differentiating quotient of two functions.

Let y be $f(x) = u(x)/v(x)$

$$= u/v$$

$$(u/v)' = u(1/v)' + 1/v(u)'$$

$$= (vu' - uv')/v^2$$

Example

$Y = \sin x/x$ Solution:

$$U = \sin x \quad v = x$$

$$U' = \cos x \quad v' = 1$$

$$(X(\cos x) - \sin x)/x^2$$

Example 2

$Y = \cos x/x^2$ Solution:

$$U = \cos x \quad v = x^2$$

$$U' = -\sin x \quad v' = 2x$$

$$(Vu' - uv')/v^2$$

$$(X^2(-\sin x) - \cos x (2x))/x^4$$

$$(-x^2 \sin x - 2x(\cos x))/x^4$$

$$= [\sin x/x^2 - 2 \cos x/x^3]$$

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