

# Chain Rule WS 2

$$1) \frac{dy}{dx} = \sec^2(x^3) \cdot (3x^2)$$

$$2) \frac{dy}{dx} = 2(\sec x)'(\sec x \cdot \tan x)$$

$$3) \frac{dy}{dx} = (e^{3x})(3)$$

$$4) \frac{dy}{dx} = 2(e^{x^2-4})(2x)$$

$$5) \frac{dy}{dx} = \left(\frac{1}{5x}\right)(5)$$

$$6) \frac{dy}{dx} = \left(\frac{1}{9x^2}\right)(18x)$$

$$7) \frac{dy}{dx} = (e^{6x})(6) - (3\csc^2(x))(-\csc x \cot x)$$

$$8) \frac{dy}{dx} = \frac{(-\csc^2(4x))(4)(e^{2x}) - (e^{2x})(2)(\cot 4x)}{(e^{2x})^2}$$

$$9) \frac{dy}{dx} = (e^{x^3})(3x^2)(\sin 7x) + (\cos 7x)(7)(e^{x^3})$$

$$10) \frac{dy}{dx} = (-18x^2)(\ln(3x^3)) + \left(\frac{1}{3x^3}\right)(9x^2)(-6x^3)$$

$$11) \frac{dy}{dx} = \frac{\left[\frac{1}{2}(6x^3-10x^2)^{-1/2}(18x^2-20x)\right](2^{3x}) - (2^{3x} \cdot \ln 2)(3)(\sqrt{6x^3-10x^2})}{(2^{3x})^2}$$

$$12) \frac{dy}{dx} = \frac{\left(\frac{1}{8x \cdot \ln 10}\right)(8)(\cos 9x) - (-\sin 9x)(9)(\log 8x)}{\cos^2 9x}$$

Simplify:

$$1) 3x^2 \sec^2(x^3)$$

$$2) 2 \sec^2 x \tan x$$

$$3) 3e^{3x^2-4}$$

$$4) 4xe^{x^2-4}$$

$$5) \frac{1}{x}$$

$$6) \frac{2}{x}$$

$$7) 6e^{6x} + 3 \csc^3 x \cot x$$

$$8) \frac{-4 \csc^2(4x) - 2 \cot(4x)}{e^{2x}}$$

$$9) 3x^2 e^{x^3} \sin(7x) + 7e^{x^3} \cos(7x)$$

$$10) -18x^2 \ln(3x^3) - 18x^2$$

$$11) \frac{\frac{18x^2 - 20x}{2\sqrt{6x^3 - 10x^2}} - 3 \ln 2 (\sqrt{6x^3 - 10x^2})}{2^{3x}}$$

$$12) \frac{\frac{\cos(9x)}{x \cdot \ln 10} + 9 \sin(9x) \log(8x)}{\cos^2 9x}$$