

Derivatives using the product
and quotient rule.

Find the derivatives of the following functions

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

$$2) f(x) = \frac{x^4 + 3x^3}{x^2 + 2x}$$

$$3) f(x) = \frac{3 \ln(x)}{\arcsin(x)}$$

$$4) f(x) = 3 \tan(x) \cdot 4 \ln(x)$$

$$5) f(x) = 2e^{2x} \cdot -\sin(x^2)$$

$$6) f(x) = \arcsin(3x^2) \cdot (3x^2 + 2x + 4)$$

$$7) f(x) = \frac{3 \ln(x^2)}{\sin(x)}$$

$$8) f(x) = \sin(x^2) \cdot \cos(2x^3)$$

$$9) f(x) = (2x^3 + 5x^2 + 3x) \cdot (3x^2 + 2x)$$

$$10) f(x) = 2 \ln(4x) \cdot \arcsin(x^2)$$

$$11) e^{(x^2 + 2x + 2)} \cdot \cos(4x^2 + 2x)$$

$$12) f(x) = \frac{e^{(x^2 + 2x)}}{3 \arcsin(x^2)}$$

$$13) f(x) = \frac{4x^3 + 2x^2 + x}{x^2 + 3x + 2}$$

$$14) f(x) = e^{(3x^3 + 2x)} \cdot 3 \ln(x^3)$$

$$15) f(x) = \frac{3 \tan(x^2)}{\sin(x^2 + 4x)}$$