

CLASSWORK

Name: _____

Product Rule

1 Use the product rule to differentiate:

a $f(x) = x(x - 1)$

b $f(x) = 2x(x + 1)$

c $f(x) = x^2\sqrt{x+1}$

2 Find $\frac{dy}{dx}$ using the product rule:

a $y = x^2(2x - 1)$

b $y = 4x(2x + 1)^3$

c $y = x^2\sqrt{3-x}$

d $y = \sqrt{x}(x - 3)^2$

e $y = 5x^2(3x^2 - 1)^2$

f $y = \sqrt{x}(x - x^2)^3$

Quotient Rule

1 Use the quotient rule to find $\frac{dy}{dx}$ if:

a $y = \frac{1 + 3x}{2 - x}$

b $y = \frac{x^2}{2x + 1}$

c $y = \frac{x}{x^2 - 3}$

d $y = \frac{\sqrt{x}}{1 - 2x}$

e $y = \frac{x^2 - 3}{3x - x^2}$

f $y = \frac{x}{\sqrt{1 - 3x}}$

2 Find the gradient of the tangent to:

a $y = \frac{x}{1 - 2x}$ at $x = 1$

b $y = \frac{x^3}{x^2 + 1}$ at $x = -1$