W4 – The Quotient Rule Unit 1

MCV4U

Jensen

1) Use the quotient rule to differentiate each function

a) $h(x) = \frac{x}{x+1}$

b) $h(t) = \frac{2t-3}{t+5}$

c) $h(x) = \frac{x^3}{2x^2-1}$

d) $h(x) = \frac{1}{x^2+3}$

e) $y = \frac{x(3x+5)}{1-x^2}$

f) $y = \frac{x^2-x+1}{x^2+3}$

2) Determine $\frac{dy}{dx}$ at each given value of x.

a) $y = \frac{3x+2}{x+5}$ at $x = -3$

b) $y = \frac{x^3}{x^2+9}$ at $x = 1$

3) Find the point(s) at which the tangent to the curve is horizontal.

a) $y = \frac{2x^2}{x-4}$

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

4) Determine the equation of the tangent to the curve $y = \frac{x^2-1}{3x}$ at $x = 2$.

Answers:

1a) $h'(x) = \frac{1}{(x+1)^2}$ **b)** $h'(t) = \frac{13}{(t+5)^2}$ **c)** $h'(x) = \frac{2x^4-3x^2}{(2x^2-1)^2}$ **d)** $h'(x) = \frac{-2x}{(x^2+3)^2}$ **e)** $y' = \frac{5x^2+6x+5}{(1-x^2)^2}$ **f)** $\frac{dy}{dx} = \frac{x^2+4x-3}{(x^2+3)^2}$

2)a) $\frac{13}{4}$ **b)** $\frac{7}{25}$

3)a) (0,0) and (8,32) **b)** no horizontal tangents

4) $y = \frac{5}{12}x - \frac{1}{3}$