

## PRODUCT RULE AND QUOTIENT RULE

- 1) Find the value of  $\frac{dy}{dx}$  at the point (1,8) on the curve with equation  $y = x^2(3x - 1)^3$
- 2) Find the value of  $\frac{dy}{dx}$  at the point (4,36) on the curve with equation  $y = 3x(2x + 1)^{\frac{1}{2}}$
- 3) Find the value of  $\frac{dy}{dx}$  at the point  $(2, \frac{1}{5})$  on the curve with equation  $y = (x - 1)(2x + 1)^{-1}$
- 4) Find the points where the gradient is zero on the curve with equation  $y = (x - 2)^2(2x + 3)$
- 5) Find the value of  $\frac{dy}{dx}$  at the point  $(1, \frac{1}{4})$  on the curve with equation  $y = \frac{x}{3x+1}$
- 6) Find the value of  $\frac{dy}{dx}$  at the point (12,3) on the curve with equation  $y = \frac{x+3}{(2x+1)^{\frac{1}{2}}}$
- 7) Find the value of  $\frac{dy}{dx}$  at the point (1,1) on the curve with equation  $y = \frac{x^2+3}{3x^3+1}$
- 8) Find the value of  $\frac{dy}{dx}$  at the point  $(1, -\frac{5}{4})$  on the curve with equation  $y = \frac{(x^3-2)(3x^4+2x)}{3x+1}$
- 9) Find the value of  $\frac{dy}{dx}$  of the curve with equation  $y = \frac{(3x-4)^3(2x+1)^2}{(5x-2)^4}$  when  $x = 2$
- 10) Find the value of  $\frac{dy}{dx}$  of the curve with equation  $y = \frac{(3x^3-4)^6(2x+1)^7}{(5x^2-2)^2}$  when  $x = 1$

$$B = \frac{183}{16} \quad H = 13 \quad L = -\frac{5}{16}$$

$$W = 38 \quad A = \frac{3}{25} \quad Q = (-2,0) \text{ and } (\frac{1}{3}, 12\frac{19}{27})$$

$$K=3 \quad R = \frac{2}{25} \quad E = -1.75$$

$$P = (2,1) \text{ and } (-\frac{1}{3}, 12\frac{17}{27}) \quad J = \frac{19}{16}$$

$$A = \frac{1}{16} \quad X = -\frac{3}{17} \quad U = -7$$

$$J = 7 \quad C = 52 \quad P = \frac{41}{236196}$$

$$P = (2,0) \text{ and } (-\frac{1}{3}, 12\frac{19}{27}) \quad D = \frac{147}{16}$$

$$O = \frac{385}{236196} \quad T = 44 \quad S = -13608$$