SPM Questions (Differentiation) – Paper 2

Note : Mostly asked in Paper 1 since 2004.

1. (SPM 2004, P2, Q5)

The gradient function of a curve which passes through $A(1, -12)$ is $3x^2 - 6x$.
Find

(a) the equation of the curve, [3 *marks*]

(b) the coordinates of the turning points of the curve and determine whether each of the turning points is a maximum or a minimum. [5 *marks*]

SPM Questions (Differentiation) – Paper 1

1. (SPM 2006, P1, Q17)

The point P lies on the curve $y = (x - 5)^2$. It is given that the gradient of the normal at P is $-\frac{1}{4}$.

Find the coordinates of P. [3 *marks*]

2. (SPM 2006, P1, Q18)

It is given that $y = \frac{2}{3}u^7$, where $u = 3x - 5$.

Find $\frac{dy}{dx}$ in terms of x. [3 *marks*]

3. (SPM 2006, P1, Q19)

Given that $y = 3x^2 + x - 4$,

(a) find the value of $\frac{dy}{dx}$ when $x = 1$,

(b) express the approximate change in y, when x changes from 1 to $1 + p$, where p if a small value. [4 *marks*]

4. (SPM 2005 P1, Q19)

Given that $h(x) = \frac{1}{(3x-5)^2}$, evaluate $h''(1)$. [4 *marks*]

5. (SPM 2005 P1, Q20)

The volume of water, V cm^3, in a container is given by $V = \frac{1}{3}h^3 + 8h$, where h cm is the height of the water in the container. Water is poured into the container at the rate of 10 cm^3 s^{-1}.

Find the rate of change of water, in cm s-1, at the instant when its height is 2 cm. [3 *marks*]

6. (SPM 2004 P1, Q20)

Differentiate $3x^2(2x-4)^4$ with respect to x. [3 *marks*]

7. (SPM 2005 P1, Q21)

Two variables, x and y, are related by the equation $y = 3x + \frac{2}{x}$.

Given that y increases at a constant rate of 4 units per second, find the rate of change of x when $x = 2$. [3 *marks*]