



Subject/Topic: A Maths P2 2018

Date:

8(iv)  ~~$2^{3y+1} + 5(2^{2y}) = 18$~~

$$(x-3)^2 = 0$$

$$2(2^{3y}) + 5(2^{2y}) - 18 = 0$$

$$x = 3$$

$$2(2^y)^3 + 5(2^y)^2 - 18 = 0$$

$$y = 19(3) - 13$$

$$= 44$$

The above equation is comparable to the equation  $2x^3 + 5x^2 - 18 = 0$  with  $x = 2^y$

The coordinates of the point of contact is (3, 44).

Therefore,  $2^y = \frac{3}{2}$

(ii)  $y = 2x^2 + (k+2)x + k$

$$\ln 2^y = \ln \frac{3}{2}$$

$$y \ln 2 = \ln \frac{3}{2}$$

$$y = \frac{\ln \frac{3}{2}}{\ln 2}$$

$$= 0.5849625007$$

$$\approx 0.585$$

When  $y$  cannot be negative, <sup>the curve</sup> must lie on or above the  $x$ -axis.

$$b^2 - 4ac \leq 0$$

$$(k+2)^2 - 4(2)(k) \leq 0$$

$$k^2 + 4k + 4 - 8k \leq 0$$

$$k^2 - 4k + 4 \leq 0$$

$$(k-2)^2 \leq 0$$

9(i) When  $k=5$ ,  $y = 2x^2 + 7x + 5$

But any perfect square cannot be negative, so the only valid solution arises from  $(k-2)^2 = 0$

At the points of intersection (if any) with the line  $y = 19x - 13$ ,

Therefore,  $k = 2$ .

$$2x^2 + 7x + 5 = 19x - 13$$

$$2x^2 - 12x + 18 = 0$$

$$x^2 - 6x + 9 = 0$$

$$b^2 - 4ac = (-6)^2 - 4(1)(9)$$

$$= 36 - 36$$

$$= 0$$

showing that the line is a tangent to the curve.

Tuition classes for English, Math (including E Maths & A Maths), Science (including combined science [phy/chem/bio]), Physics, Chemistry, Biology, Social Studies/Geography/History and Principles of Accounts (POA). Secondary 1 to Secondary 4.

