

O Level A Maths Tutorial 10: Gradients and Derivatives

Syllabus :

- Derivative of $f(x)$ as the gradient of the tangent to the graph of $y = f(x)$.

1.

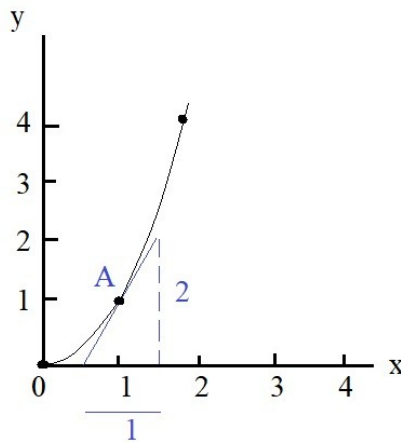


Figure 10-1

(i) In the graph above, $y = x^2$, the tangent at $A(1, 1)$ is a line touching the graph at point A. Using the triangle touching point A, find the gradient of this tangent.

(ii) Using a method called differentiation, there is a formula for the gradient of $y = x^2$:

$$\frac{dy}{dx} = 2x$$

$\frac{dy}{dx}$ is a symbol for the gradient of the tangent at a point on a graph. Using the above formula, find the gradient of the tangent at A.

Is your answer the same as your part (i) value?

2. The formula for gradient of $y = x^n$ for any power n is given by

$$\frac{dy}{dx} = n x^{n-1}$$

Find $\frac{dy}{dx}$ for the following :

(i) $y = x^2$

(ii) $y = x^3$

(iii) $y = 4x^2$