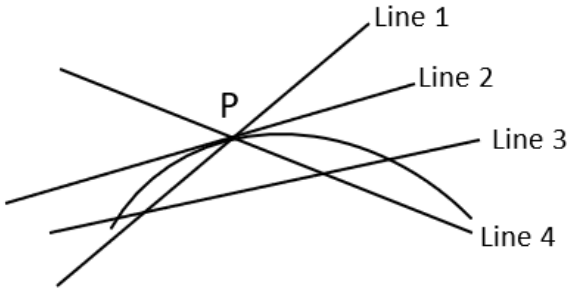
CALCULUS 3: QUIZ SOLUTIONS

Question 1

In the diagram, which line is the tangent to the curve at the point P?



A. Line 1 B. Line 2 C. Line 3 D. Line 4

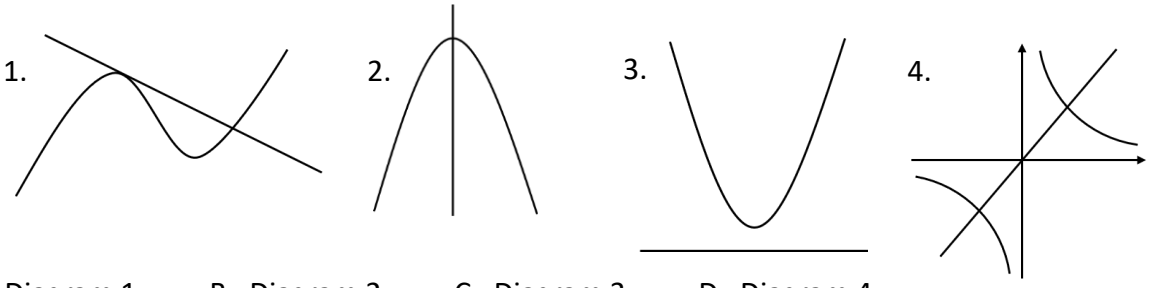
Solution

Line 1 cuts the curve at P, so is not a tangent.
Line 2 touches the curve at P, so it is a tangent.
Line 3 cuts the curve in two points, so it is not a tangent.
Line 4 cuts the curve at P, so is not a tangent.

So, the correct answer is B.

Question 2

In which diagram is the straight line a tangent to the curve?



A. Diagram 1 B. Diagram 2 C. Diagram 3 D. Diagram 4

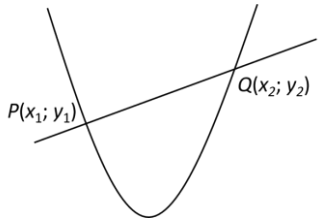
Solution

In Diagram 1, the straight line touches the curve at a point, so it is a tangent.
In Diagram 2, the straight line cuts the curve, so it is not a tangent.
In Diagram 3, the straight line does not touch the curve, so it is not a tangent.
In Diagram 4, the straight line cuts the curve, so it is not a tangent.

So, the correct answer is A.

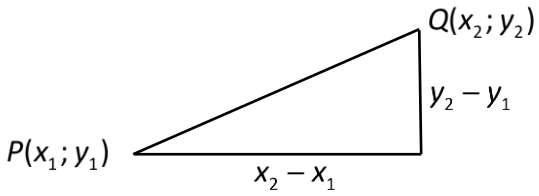
Question 3

Which of the following expressions is the gradient of the line passing through P and Q?



A. $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ B. $m = \dfrac{x_2 - x_1}{y_2 - y_1}$ C. $m = \dfrac{y_2 - x_2}{y_1 - x_1}$ D. $m = \dfrac{x_2 - y_2}{x_1 - y_1}$

Solution



So, the correct answer is A.

Question 4

The value of the derivative of a function $f(x)$ at $x = a$ is the same as the gradient of the tangent to $f(x)$ at $x = a$.

A. True B. False

Solution

The statement is true.

So, the correct answer is A.

Question 5

Which of the following expressions represents the derivative of the function $f(x)$?

A. $f'(x) = \dfrac{f(x+h) - f(x)}{h}$

B. $f'(x) = \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{x+h}$

C. $f'(x) = \lim\limits_{x \to h} \dfrac{f(x+h) - f(x)}{x}$

D. $f'(x) = \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$

Solution

The derivative of the function $f(x)$ is given by $f'(x) = \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$

So, the correct answer is D.