

## Mean Value Theorems Ex 15.2 Q5 Here,

curve is 
$$y = (x - 4)^2$$

Since, it a polynomial function so it is differentiable and continuous. So, it Lagrange's mean value theorem is applicable, so, there exist a point c such that,

Lagrange's mean value theorem 
$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

$$\Rightarrow 2(c - 4) = \frac{f(5) - f(4)}{5 - 4}$$

$$\Rightarrow 2c - 8 = \frac{1 - 0}{1}$$

$$\Rightarrow 2c = 9$$

$$\Rightarrow c = \frac{9}{2}$$

$$\Rightarrow y = \left(\frac{9}{2} - 4\right)^2$$

Thus, 
$$(c, y) = \left(\frac{9}{2}, \frac{1}{4}\right)$$
 is required point.

## Mean Value Theorems Ex 15.2 Q6

Here

$$y = x^2 + x$$

Since, y is a polynomial function, so it continuous differentiable,

 $\Rightarrow$  Lagrange's mean value theorem is applicable, so, there exist a point c such that,

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

$$\Rightarrow 2c + 1 = \frac{f(1) - f(0)}{1 - 0}$$

$$\Rightarrow 2c + 1 = 2$$

$$\Rightarrow c = \frac{1}{2}$$

$$\Rightarrow y = \left(\frac{1}{2}\right)^2 + \frac{1}{2}$$

$$\Rightarrow y = \frac{3}{4}$$
So,  $(c, y) = \left(\frac{1}{2}, \frac{3}{4}\right)$  is the required point.

Mean Value Theorems Ex 15.2 Q7

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

Since, y is a polynomial function, so it continuous differentiable,

- Lagrange's mean value theorem is applicable
- There exist a point c such that,  $\Rightarrow$

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

$$\Rightarrow 2(c-3) = \frac{f(4) - f(3)}{4 - 3}$$

$$\Rightarrow 2c - 6 = \frac{1 - 0}{1}$$

$$\Rightarrow 2c - 6 = \frac{1 - 0}{1}$$

$$\Rightarrow$$
 2c = 7

$$\Rightarrow$$
  $c = \frac{7}{2}$ 

$$\Rightarrow \qquad y = \left(\frac{7}{2} - 3\right)^2$$

$$\Rightarrow \qquad y = \frac{1}{4}$$

So, 
$$(c, y) = \left(\frac{7}{2}, \frac{1}{4}\right)$$
 is the required point.

\*\*\*\*\*\*\*\*\* END \*\*\*\*\*\*\*