CONTINUITY AND DIFFERENTIABILITY

SECOND ORDER DERIVATIVE

EXERCISE

Q.1 Find the second order derivative of $y = 9\log t^3$.

(a) $\frac{27}{t^2}$ (b) $-\frac{27}{t^2}$

(c) $-\frac{1}{t^2}$ (d) $-\frac{27}{2t^2}$

Q.2 Find $\frac{d^2y}{dx^2}$, if $y = \tan^2 x + 3\tan x$

(a) $\sec^2 x \tan x(2\tan x + \sec x + 3)$ (b) $2\sec^2 x \tan x(2\tan x - \sec x + 3)$

(c) $2\sec^2 x \tan x(2\tan x + \sec x + 3)$ (d) $2\sec^2 x \tan x(2\tan x + \sec x - 3)$

Q.3 If $y = 6x^2 + 3$, then $\left(\frac{dy}{dx}\right)^2 = \frac{d^2y}{dx^2}$.

(a) True

(b) False

Q.4 Find the second order derivative of $y = 2e^{2x} - 3\log(2x-3)$

(a) $8e^{2x} + \frac{1}{(2x-3)^2}$ (b) $8e^{2x} - \frac{12}{(2x-3)^2}$

(c) $e^{2x} + \frac{12}{(2x-3)^2}$ (d) $8e^{2x} + \frac{12}{(2x-3)^2}$

Q.5 Find $\frac{d^2y}{dx^2}$, if $y = 2\sin^{-1}(\cos x)$

(a) 0

(b) $\sin^{-1}\left(\frac{1}{\cos x}\right)$

(c) 1

(d) -1

Q.6 If $y = \log\left(2x^3\right)$, find $\frac{d^2y}{dx^2}$.

(a) $-\frac{2}{x^2}$

(b) $\frac{3}{x^2}$

(c) $\frac{2}{x^2}$

(d) $-\frac{3}{x^2}$

Q.7 Find $\frac{d^2y}{dx^2} - 6\frac{dy}{dx}$ if $y = 4x^4 + 2x$

(a) $\left(4x^2 + 8x - 1\right)$

(b) $12\left(4x^2 + 8x - 1\right)$

(c) $-12\left(4x^2 + 8x - 1\right)$

(d) $12\left(4x^2 - 8x - 1\right)$

Q.8 Find the second order derivative of $y = e^{2x} + \sin^{-1} e^x$.

(a) $e^{2x} + \frac{e^x}{\left(1 - e^2x\right)^{3/2}}$

(b) $4e^{2x} + \frac{1}{\left(1 - e^2x\right)^{3/2}}$

(c) $4e^{2x} - \frac{e^x}{\left(1 - e^2x\right)^{3/2}}$

(d) $4e^{2x} + \frac{e^{x^2}}{\left(1 - e^2x\right)^{3/2}}$

Q.9 Find the second order derivative of $y = 3x^2 1 + \log(4x)$

(a) $3 + \frac{1}{x^2}$ (b) $3 - \frac{1}{x^2}$

(c) $6 - \frac{1}{x^2}$ (d) $6 + \frac{1}{x^2}$

Q.10 Find the second order derivative of $y = e^{2x^2}$

(a) $4e^{2x^2}\left(4x^2 + 3\right)$ (b) $4e^{2x^2}\left(4x^2 - 1\right)$

(c) $4e^{2x^2}\left(4x^2 + 1\right)$ (d) $e^{2x^2}\left(4x^2 + 1\right)$

ANSWER KEY

1. (b)

2. (c)

3. (b)

4. (d)

5. (a)

6. (d)

7. (d)

8. (d)

9. (c)

10. (c)