Differentiation

1. $\frac{d}{dx}(\sin 30°)$ is equal to

(1) cos 30° (2) cosec 30°
(3) 0 (4) sin 30°

2. If $y = 4x^2 - 2x + 4$ then find $\frac{dy}{dx}$

(1) $8x - 2x$ (2) $8x - 2$
(3) $8x - 2 + 4$ (4) $4x + 4$

3. $y = 2t\,(3 - t)$ then find $\frac{dy}{dt}$.

(1) $6 - 8t$ (2) $6 - 4t$
(3) $6 + 5t$ (4) None of these

4. If $y = x^2 + 4x^3 - 8x + 4$, then find $\frac{dy}{dx}$

(1) $2x + 4x^2 - x$ (2) $2x + 12x^2 - 8$
(3) $2x + 4x^3 - 8$ (4) $2x + 12x^2 - x$

5. Find $\frac{dv}{dt}$ at $t = 2$, if $v = 2t^2 + 4t$

(1) 4 (2) 8
(3) 12 (4) 16

6. $\frac{d}{dx}\left(1 + \frac{1}{x^2} + \frac{1}{x^3}\right)$

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

(2) $\frac{-2}{x^3} - \frac{3}{x^4}$

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

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

7. $y = \sec x + \tan x$, value of $\frac{dy}{dx}$ is:

(1) $\sec^2 x + \tan x$
(2) $\tan^2 x + \sec x$
(3) $\sec x\,(\tan x + \sec x)$
(4) $\sec x\,(1 + \sec x)$

8. $\frac{d}{dx}\left(1 + \frac{1}{x} + \log x + \tan x\right) =$

(1) $1 - \frac{1}{x^2} + \sec^2 x$

(2) $1 + \frac{1}{x^2} + \sec^2 x$

(3) $1 + \frac{1}{x^2} + \frac{1}{x} + \sec^2 x$

(4) $-\frac{1}{x^2} + \frac{1}{x} + \sec^2 x$

9. $\frac{d}{dx}\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2$ is equal to:

(1) $1 + \frac{1}{x^2}$ (2) $-1 + \frac{1}{x^2}$
(3) $1 - \frac{1}{x^2}$ (4) $x^2 - 1$

10. If $y = \ln x + e^x$, then find $\frac{dy}{dx}$

(1) $e^x + x$ (2) $\ln x + x$
(3) $\frac{1}{x} + e^x$ (4) $\frac{1}{x} + e$

11. $y = (1 - x^2)^{10}$, then find $\frac{dy}{dx}$.

(1) $10(1 - x^2)^9$, (2) $10(1 - x^2)^9\,x^2$
(3) $-20x\,(1 - x^2)^9$ (4) Not differentiable