

1. If  $\sqrt{x} + \sqrt{y} = 1$  then  $y'$  equals  
 a)  $x^{-1/2}y^{1/2}$     b)  $-y^{1/2}x^{-1/2}$     c)  $-x^{-1/2}y^{-1/2}$     d)  $x^{1/2}y^{-1/2}$     e) none of these

2. Find  $\frac{dy}{dx}$  if  $y^2 - 3xy + x^2 = 7$ .

- (a)  $\frac{2x + y}{3x - 2y}$     (b)  $\frac{3y - 2x}{2y - 3x}$     (c)  $\frac{2x}{3 - 2y}$   
 (d)  $\frac{2x}{y}$     (e) None of these

3. Find  $\frac{dy}{dx}$  for  $5x^2 - 2xy + 7y^2 = 0$ .

- (a)  $\frac{5x + 7y}{x}$     (b)  $\frac{y - 5x}{7y}$     (c)  $10x - 2y + 14y$   
 (d)  $\frac{y - 5x}{7y - x}$     (e) None of these

4. If  $xy - y = 2x + 4$ ,  $dy/dx$  is

- a)  $\frac{y-2}{x-1}$     b)  $\frac{2-y}{x-1}$     c)  $\frac{y-6}{x-1}$     d)  $\frac{2}{x-1}$     e)  $\frac{y-2}{x+1}$

5.) Differentiate:  $y = \frac{1 + \cos x}{1 - \cos x}$ .

- (a)  $-1$     (b)  $-2 \csc x$     (c)  $2 \csc x$   
 (d)  $\frac{-2 \sin x}{(1 - \cos x)^2}$     (e) None of these

6. Find the derivative:  $f(x) = \frac{1}{\sqrt[3]{3 - x^3}}$ .

- (a)  $\frac{-1}{3(3 - x^3)^{4/3}}$     (b)  $\frac{x^2}{(3 - x^3)^{4/3}}$     (c)  $\frac{-x^2}{(3 - x^3)^{2/3}}$   
 (d)  $\frac{-x^2}{(3 - x^3)^{4/3}}$     (e) None of these

7.) Find  $f'(x)$ :  $f(x) = \frac{x^2 - 3x}{x^2}$ .

- (a)  $\frac{2x - 3}{x^2}$     (b)  $\frac{2x - 3}{2x}$     (c)  $1 - \frac{3}{x}$   
 (d)  $\frac{3}{x^2}$     (e) None of these

8. Find  $\frac{dy}{dx}$  if  $y = \sin(x + y)$ .

- (a) 0    (b)  $\frac{\cos(x + y)}{1 - \cos(x + y)}$     (c)  $\cos(x + y)$   
 (d) 1    (e) None of these

9. Find  $\frac{dy}{dx}$  if  $x^2y + y^2 = x$ .

(a)  $\frac{1}{2x + 2y}$

(b)  $\frac{1 - 2xy - 2y}{x^2}$

(c)  $\frac{1 - 2xy}{x^2 + 2y}$

(d)  $\frac{1}{x}$

(e) None of these

10.  $\lim_{h \rightarrow 0} \frac{\cos(\frac{\pi}{4} + h) - \cos(\frac{\pi}{4})}{h} =$

a)  $-\frac{\sqrt{3}}{2}$

b)  $-\frac{\sqrt{2}}{2}$

c) 0

d)  $\frac{\sqrt{2}}{2}$

e) 1

11. Differentiate:  $y = \sec^2 x + \tan^2 x$ .

(a) 0

(b)  $\tan x + \sec^4 x$

(c)  $\sec^2 x(\sec^2 x + \tan^2 x)$

(d)  $4 \sec^2 x \tan x$

(e) None of these

12. Differentiate:  $f(x) = -x + \tan x$ .

(a)  $-1 + \tan^2 x$

(b)  $\sec^2 x$

(c)  $\tan^2 x$

(d)  $-1 + \tan x$

(e) None of these

13. Differentiate:  $y = \sin^2 t - \cos^2 t$ .

(a) 0

(b) 1

(c)  $2 \sin 2t$

(d)  $-4 \sin t \cos t$

(e) None of these

14. Find  $f'(x)$ :  $f(x) = \frac{x^2 - 4x}{\sqrt{x}}$ .

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

(b)  $\frac{2x - 4}{\sqrt{x}}$

(c)  $\frac{2x - 4}{1/(2\sqrt{x})}$

(d)  $x^{3/2} - 4x^{1/2}$

(e) None of these

15. Find  $\frac{dy}{dx}$  if  $x^2 + y^2 = 2xy$ .

(a)  $\frac{x}{1 - y}$

(b)  $\frac{y + x}{y - x}$

(c) 1

(d)  $-\frac{x}{y}$

(e) None of these

16. Find  $\frac{dy}{dx}$  for  $y = x^3\sqrt{x+1}$ .

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

(b)  $\frac{x^2(7x+6)}{2\sqrt{x+1}}$

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

(d)  $\frac{7x^3 + x^2}{2\sqrt{x+1}}$

(e) None of these

17. Find  $\frac{d^2y}{dx^2}$  for  $y = \frac{x+3}{x-1}$ .

(a) 0

(b)  $\frac{-8}{(x-1)^3}$

(c) None of these

(d)  $\frac{8}{(x-1)^3}$

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