

**TOPICS : Mathematical Tools**

- $\sin 300^\circ$  is equal to  
(a)  $1/2$  (b)  $-1/2$   
(c)  $-\frac{\sqrt{3}}{2}$  (d)  $\frac{\sqrt{3}}{2}$
- Value of  $\tan 225^\circ$  is :  
(a)  $\sqrt{3}$  (b)  $\frac{1}{\sqrt{3}}$   
(c) 1 (d) -1
- Value of  $\sin 15^\circ \cdot \cos 15^\circ$  is :  
(a) 1 (b)  $1/2$   
(c)  $1/4$  (d)  $\frac{\sqrt{3}}{2}$
- Value of  $\sin (37^\circ) \cos (53^\circ)$  is -  
(a)  $\frac{9}{25}$  (b)  $\frac{12}{25}$   
(c)  $\frac{16}{25}$  (d)  $\frac{3}{5}$
- If  $\sin \theta = \frac{1}{3}$ , then  $\cos \theta$  will be -  
(a)  $\pm \frac{8}{9}$  (b)  $\pm \frac{4}{3}$   
(c)  $\pm \frac{2\sqrt{2}}{3}$  (d)  $\pm \frac{3}{4}$
- Which of the following has value 1 :  
(a)  $\tan 45^\circ$  (b)  $\sin 90^\circ$   
(c)  $\cos 90^\circ$  (d)  $\cos 0^\circ$
- $y = x^3 + 2x^2 + 7x + 8$  then  $\frac{dy}{dx}$  will be -  
(a)  $3x^2 + 2x + 15$   
(b)  $3x^2 + 4x + 7$   
(c)  $x^3 + 2x^2 + 15$   
(d)  $x^3 + 4x + 7$
- Differentiation of  $2x^2 + 3x$  w.r.t.  $x$  is :  
(a)  $4x + 3$  (b)  $4x$   
(c) 3 (d)  $4x + 1$
- Equation of straight line is  $2x + 3y = 5$ . Slope of the straight line is :  
(a)  $3/2$  (b)  $2/3$   
(c)  $-2/3$  (d)  $-3/2$
- $y = x^4 + 3x^2 + \pi + 2$ . Find  $\frac{dy}{dx}$  :

**TOPICS : Mathematical Tools (SOLUTION)**

1. (C)    2. (C)    3. (C)    4. (A)    5. (C)    6. (ABD)    7. (B)  
 8. (A)    9. (C)    10.  $4x^3 + 6x$

$$1. \sin 300^\circ = \sin (360 - 60) = -\sin 60^\circ = -\frac{\sqrt{3}}{2}$$

$$2. \tan 225^\circ = \tan (180 + 45) = \tan 45^\circ = 1$$

$$3. \sin 15^\circ \cos 15^\circ = \frac{\sin 30^\circ}{2} = \frac{1}{4}$$

$$4. \sin 37^\circ \times \cos 53^\circ = \frac{3}{5} \times \frac{4}{5} = \frac{12}{25}$$

$$5. \cos \theta = \sqrt{1 - \sin^2 \theta} = \sqrt{1 - \frac{1}{9}} = \pm \frac{2\sqrt{2}}{3}$$

$$6. \tan 45^\circ = 1 \quad \sin 90^\circ = 1 \quad \cos 0^\circ = 1$$

$$7. y = x^3 + 2x^2 + 7x + 8$$

$$\frac{dy}{dx} = 3x^2 + 4x + 7$$

$$8. y = 2x^2 + 3x$$

$$\frac{dy}{dx} = 4x + 3$$

$$9. y = -\frac{2}{3}x + \frac{5}{3} \Rightarrow \frac{dy}{dx} = -\frac{2}{3}$$

$$\text{Alter : } y = mx + c$$

$$(\text{slope}) m = -\frac{2}{3}$$

$$10. y = x^4 + 3x^2 + \pi + 2; \frac{dy}{dx} = 4x^3 + 6x$$