

# Class XI- MATHEMATICS

## Chapter-3 : TRIGONOMETRIC FUNCTIONS

### Worksheet of Module 3/3

#### MCO / One mark questions

- 1 If A is an acute angle, then  $\sin\left(\frac{\pi}{4} + A\right) \sin\left(\frac{\pi}{4} - A\right)$  is  
a)  $\cos 2A$                       b)  $\frac{1}{2} \cos 2A$                       c)  $\cos A$                       d)  $\frac{1}{2} \cos A$
- 2 if  $\tan x = \frac{-4}{3}$  and x lies in II Quadrant, then  $\sin \frac{x}{2}$  is  
a)  $\frac{1}{2}$                       b)  $\frac{1}{3}$                       c)  $\frac{1}{5}$                       d)  $\frac{1}{\sqrt{5}}$
- 3 The value of  $\sin 600^\circ \cdot \tan (-690^\circ) + \sec 840^\circ \cdot \cot(-945^\circ)$  is  
a)  $1/2$ .                      b)  $3/2$ .                      c) 1                      d) 0
- 4 If A, B, C, and D are the angles of a cyclic quadrilateral, then the value of  $\cos A + \cos B + \cos C + \cos D$  is  
a)  $360^\circ$                       b)  $180^\circ$                       c)  $90^\circ$                       d) 0
- 5 If  $x = \tan \theta$ , then  $\frac{1-x^2}{1+x^2}$  is  
a)  $\cos 2\theta$                       b)  $\cos \theta$                       c)  $\cos \frac{\theta}{2}$                       d)  $\cos 2\theta$
- 6 The value of  $2\sin 2A - 8\cos A \sin^3 A$  is  
a)  $\cos 3A$                       b)  $\sin 3A$                       c)  $\sin 4A$                       d)  $\frac{1}{2} \sin 4A$
- 7 If  $A + B = \frac{\pi}{4}$ , then the value of  $(1+\tan A)(1+\tan B)$  is  
a) 0                      b) 1                      c) 2                      d) 3
- 8 If  $\cos A + \cos B = 2$ , then the value of  $\cos^2 \frac{A}{2} + \cos^2 \frac{B}{2}$  is  
a) 0                      b) 1                      c) 2                      d)  $4/3$
- 9 Find the value of  $\tan 135^\circ$
- 10 Value of  $\sin 20^\circ [\tan 10^\circ + \cot 10^\circ]$  is \_\_\_\_\_.

#### Two marks Questions

- 11 Simplify:  $\frac{\sin(180^\circ+\theta) \cos(360^\circ-\theta) \tan(270^\circ-\theta)}{\sec(90^\circ+\theta) \tan(-\theta) \sin(270^\circ+\theta)}$ .
- 12 Express  $\sin 4\theta - \sin 2\theta$  as product of trigonometric functions.
- 13 In any quadrilateral ABCD, prove that  $\sin(A+B) + \sin(C+D) = 0$ .
- 14 Prove that  $\frac{\tan\left(\frac{\pi}{2}-x\right) \sec(\pi-x) \sin(-x)}{\sin(\pi+x) \cot(2\pi-x) \operatorname{cosec}\left(\frac{\pi}{2}-x\right)} = 1$

15 Express  $2\sin \theta \cos 3\theta$  as sum or difference of trigonometric functions.

**Four/Six marks Questions**

16 Show that  $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$ .

17 Prove that  $\frac{(\cos 2B - \cos 2A)}{(\sin 2B + \sin 2A)} = \tan (A - B)$

18 Prove that  $1 + \cos 2x + \cos 4x + \cos 6x = 4\cos x \cdot \cos 2x \cdot \cos 3x$

19 Show that  $\sin 2x + 2 \sin 4x + \sin 6x = 4\cos^2 x \sin 4x$ .

20 Prove that,  $\frac{\sin A \cdot \sin 2A + \sin 3A \cdot \sin 6A}{\sin A \cdot \cos 2A + \sin 3A \cdot \cos 6A} = \tan 5A$ .

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