Worksheet-3

SUBJECT – MATHEMATICS

1st term

Chapter: Trigonometry   Class: XI

Topic: Sums & Products   Date: 22.06.2020

Choose the correct option   **(1 X 15= 15)**

1. $2 \sin 25° \cos 15° = ?$
   (a) $\sin 40° + \sin 10°$ (b) $\sin 40° - \sin 10°$ (c) $-\sin 40° + \sin 10°$ (d) NOT

2. Let $f(\theta) = \dfrac{\tan^3 \theta}{1 + \tan^2 \theta} - \dfrac{\cot^3 \theta}{1 + \cot^2 \theta}, 0 < \theta < \dfrac{\pi}{4}.$
   Then $f(\theta)$ is equal to
   (a) $\tan \theta + \cot \theta$ (b) $2 \sin (2\theta)$
   (c) $-2 \cot (2\theta)$ (d) 0

3. If $0 < \theta < \dfrac{\pi}{2}$, then $\dfrac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1}$ is equal to:

   (a) $1 + \sin \theta + \cos \theta$ (b) $\dfrac{1 + \sin \theta}{\cos \theta}$

   (c) $\dfrac{1 - \cos \theta}{\sin \theta}$ (d) $\tan \theta - \sec \theta$

4. $\tan 15° + \tan 75°$ is equal to:
   (a) 1   (b) 2
   (c) 3   (d) 4

5. $\sin^2 \left(\dfrac{\pi}{8} + \dfrac{A}{2} \right) - \sin^2 \left(\dfrac{\pi}{8} - \dfrac{A}{2} \right)$ is equal to:

   (a) $\left(1/\sqrt{2} \right) \sin A$ (b) $\left(1/\sqrt{2} \right) \cos A$

   (c) $\sqrt{2} \sin A$ (d) $\sqrt{2} \cos A$

6. $\dfrac{\cos 11° - \sin 11°}{\cos 11° + \sin 11°}$ is equal to:

   (a) cot 56° (b) tan 11°
   (c) tan 56° (d) cot 11°

7. Suppose $\alpha, \beta > 0$ and $\alpha + 2\beta = \pi/2$, then
   $\tan(\alpha + \beta) - 2\tan\alpha - \tan\beta$ is equal to:
   (a) 0 (b) $\tan\beta$
   (c) $\cot\beta$ (d) $\tan\alpha - \cot\beta$

8. If $\sin\theta + \csc\theta = 2$, then $\cos^{2015}\theta + \csc^{2015}\theta$ is
   equal to:
   (a) -1 (b) 0
   (c) 1 (d) 2015

9. If $(1 - \sin A)(1 - \sin B)(1 - \sin C) = (1 + \sin A)$
   $(1 + \sin B)(1 + \sin C)$, then each side is equal to:
   (a) $\pm \cos A \cos B \cos C$ (b) 0
   (c) $\pm \sin A \sin B \sin C$ (d) 1

10. $2\cos\dfrac{\pi}{13}\cos\dfrac{9\pi}{13} + \cos\dfrac{3\pi}{13} + \cos\dfrac{5\pi}{13}$ is equal to:

    (a) -1 (b) 0
    (c) 1 (d) $\sqrt{3}/2$

11. If $\csc A + \sec A = \csc B + \sec B$, then $\tan A \tan B$
    is equal to:

    (a) $\tan\left(\dfrac{A+B}{2}\right)$ (b) $\cot\left(\dfrac{A+B}{2}\right)$

    (c) $\cot\left(\dfrac{A-B}{2}\right)$ (d) $\tan\left(\dfrac{A-B}{2}\right)$

12. If $0 < \theta < \pi/8$, then $\sqrt{2 + \sqrt{2 + 2\cos(4\theta)}}$ is equal to:

    (a) $2\cos\theta$ (b) $-2\cos\theta$
    (c) $2\sin\theta$ (d) $-2\sin\theta$

13. Let $f(\theta) = \cos\theta\cos 2\theta\cos 4\theta\cos 7\theta$, then $f(\pi/15)$
    is equal to:
    (a) 1/4 (b) 1/8
    (c) 1/16 (d) 1/32

14. Let $f(\theta) = \sin\theta\sin 3\theta\sin 5\theta$, then $f(\pi/14)$ is equal
    to:
    (a) 1/8 (b) 1/4
    (c) 1/7 (d) 1/14

15 | For $0 < \theta < \pi/4$, $\dfrac{\sec (8\theta) - 1}{\sec (4\theta) - 1} \cdot \dfrac{\tan (2\theta)}{\tan (8\theta)}$ is equal to

(a) -1 (b) 0

(c) 1 (d) none of these

Prepared by :-
SUKUMAR MANDAL (SkM).