ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

Answer Of 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. $2\sin 25^\circ \cos 15^\circ = ?$
   (a) $\sin 40^\circ + \sin 10^\circ$ (b) $\sin 40^\circ - \sin 10^\circ$ (c) $-\sin 40^\circ + \sin 10^\circ$ (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. $\tan 15^\circ + \tan 75^\circ$ 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) $(1/\sqrt{2})\sin A$ (b) $(1/\sqrt{2})\cos A$
   (c) $\sqrt{2}\sin A$ (d) $\sqrt{2}\cos A$

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

(a) $\cot 56^\circ$ (b) $\tan 11^\circ$
(c) $\tan 56^\circ$ (d) $\cot 11^\circ$

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 $\sin\theta + \operatorname{cosec}\theta = 2$, then $\cos^{2015}\theta + \operatorname{cosec}^{2015}\theta$ 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 $\operatorname{cosec} A + \sec A = \operatorname{cosec} B + \sec B$, 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 $0 < \theta < \pi/4$, $\frac{\sec(8\theta)-1}{\sec(4\theta)-1} \cdot \frac{\tan(2\theta)}{\tan(8\theta)}$ is equal to

(a) -1
(b) 0
(c) 1
(d) none of these

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1.a , 2.c , 3.b , 4.d , 5.a , 6.a , 7.a , 8.c , 9.a , 10.b , 11.b , 12.a , 13.c , 14.a , 15.c