

# HOLIDAY HOMEWORK

## ASSIGNMENT - 2

XI - (MATHS) 2018-2019

① Prove  $\cos^2 \frac{\pi}{8} + \cos^2 \frac{3\pi}{8} + \cos^2 \frac{5\pi}{8} + \cos^2 \frac{7\pi}{8} = 2$

② Solve for  $\theta$  ( $0 < \theta < 2\pi$ )

$$3(\sec^2 \theta + \cot^2 \theta) = 5$$

Ans  $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

③ Prove  $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 90^\circ = \frac{19}{2}$

④ Prove

$$\cos 2\theta \cos 2\phi + \cos^2 (\theta + \phi) - \cos^2 (\theta - \phi) = \cos (2\theta + 2\phi)$$

⑤ If  $\tan \theta = \frac{Q \sin \alpha}{P + Q \cos \alpha}$  Prove  $\tan (\alpha - \theta) = \frac{P \sin \alpha}{Q + P \cos \alpha}$

⑥ Prove  $\sin 10^\circ + \sin 20^\circ + \sin 40^\circ + \sin 50^\circ = \sin 70^\circ + \sin 80^\circ$

⑦ Prove

$$\cos 5\theta = 16 \cos^5 \theta - 20 \cos^3 \theta + 5 \cos \theta$$

⑧ Prove

$$\cos^4 \frac{\pi}{8} + \cos^4 \frac{3\pi}{8} + \cos^4 \frac{5\pi}{8} + \cos^4 \frac{7\pi}{8} = \frac{3}{2}$$

⑨ Prove

$$\frac{\cos^3 \theta - \cos 3\theta}{\cos \theta} + \frac{\sin^3 \theta + \sin 3\theta}{\sin \theta} = 3$$

⑩ Using sets Prove

(i)  $(A \cup B)' = A' \cap B'$

(ii)  $(A \cap B)' = A' \cup B'$

⑪ If  $A$  and  $B$  are sets then  $A \subset B$  iff  $B' \subset A'$

⑫ In a survey of 100 persons, 28 read magazine  $A$ , 30 read  $B$ , 42 read  $C$ , 9 read  $A$  and  $B$ , 11 read  $A$  and  $C$ , 6 read  $B$  and  $C$  and 4 read all the three Find

(i) who read None of the three Ans. 22

(ii) only  $C$  Ans. 29

⑬ Let  $T = \left\{ x : \frac{x+5}{x-7} = -5 = \frac{4x-40}{13-x} \right\}$ . Is  $T$  an

empty set

Ans No.

⑭ If  $|z+1| = z + 2(i+i)$  where  $z$  is complex

Number find  $z$  Ans  $\frac{1}{2} - 2i$

⑮ Solve  $x^2 - (7-i)x + 18-i = 0$

Ans  $3+2i, 4-3i$