EduSahara™ Assignment

Name : Complex Trigonometric Expressions Simplification

Chapter : Trigonometrical Identities

Grade : ICSE Grade X

1. $\operatorname{cosec} 30° \operatorname{cosec} 60° - \tan 30° \cot 60° =$

   (i) $(\frac{4}{3}\sqrt{3} - \frac{1}{3})$ (ii) $(\frac{4}{3}\sqrt{3} - \frac{1}{5})$ (iii) $(\frac{4}{3} - \frac{1}{3})$ (iv) $(\frac{4}{3}\sqrt{5} - \frac{1}{3})$ (v) $(\frac{4}{3}\sqrt{3} - 1)$

2. $\frac{\tan 60° \operatorname{cosec} 45° \tan 45° + \cos 0° \cos 30° \sec 60°}{\operatorname{cosec} 90° \sin 45° \cos 30° - \sin 60° \sec 0° \operatorname{cosec} 45°} =$

   (i) $(-4 - \frac{2}{3}\sqrt[4]{18})$ (ii) $(-4 - 12)$ (iii) $(-4 - \frac{2}{3}\sqrt{18})$ (iv) $(-6 - \frac{2}{3}\sqrt{18})$ (v) $(-1 - \frac{2}{3}\sqrt{18})$

3. $\frac{\sin^2 35° + \sin^2 55°}{\cos^2 15° + \cos^2 75°} =$

   (i) -1 (ii) undefined (iii) 2 (iv) 1 (v) 0

4. $\frac{\sin 20° \cos 70° + \cos 20° \sin 70°}{\sin 30° \cos 60° + \cos 30° \sin 60°} =$

   (i) 2 (ii) 0 (iii) -1 (iv) undefined (v) 1

5. $\frac{1 + \tan^2 \theta}{1 + \cot^2 \theta} =$

   (i) $\operatorname{cosec}^2 \theta$ (ii) 1 (iii) $\sec^2 \theta$ (iv) $\tan^2 \theta$ (v) $\cot^2 \theta$

6. If $\cot \theta = \frac{3}{7}$, find $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 - \cos \theta)(1 + \cos \theta)}$

   (i) $\frac{1}{7}$ (ii) $\frac{11}{49}$ (iii) $\frac{9}{49}$ (iv) $\frac{9}{47}$ (v) $\frac{3}{17}$

7. If $\tan \theta = \frac{4}{9}$, find $\frac{(1 + \cos \theta)(1 - \cos \theta)}{(1 + \sin \theta)(1 - \sin \theta)}$

   (i) $\frac{16}{79}$ (ii) $\frac{16}{81}$ (iii) $\frac{16}{83}$ (iv) $\frac{2}{9}$ (v) $\frac{14}{81}$

8. Find the value of $\frac{(1 + \sin \theta)}{(\cos \theta)} + \frac{(\cos \theta)}{(1 + \sin \theta)}$

   (i) $2\cos \theta$ (ii) $2\sec \theta$ (iii) $2\sin \theta$ (iv) $2\operatorname{cosec} \theta$

9. Find the value of $10\sec^2\theta - 10\tan^2\theta$

(i) 10 (ii) 1 (iii) 7 (iv) 0 (v) 12

10. Find the value of $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$

(i) 2 (ii) 3 (iii) (-1) (iv) 4 (v) 1

11. Find the value of $(\operatorname{cosec}\theta - \cot\theta)^2$

(i) $\dfrac{1 - \cos\theta}{1 + \cos\theta}$ (ii) $\dfrac{1 + \cos\theta}{1 - \cos\theta}$ (iii) $\dfrac{1 + \sin\theta}{1 - \sin\theta}$ (iv) $\dfrac{1 - \sin\theta}{1 + \sin\theta}$

12. If $\tan\theta + \cot\theta = 8$, find $\tan^2\theta + \cot^2\theta$

(i) 60 (ii) 61 (iii) 63 (iv) 65 (v) 62

13. If $\tan\theta - \cot\theta = 2$, find $\tan^2\theta + \cot^2\theta$

(i) 6 (ii) 8 (iii) 5 (iv) 7 (v) 3

14. Which of the following are true?

a) $\dfrac{\cos\theta}{1 - \sin\theta} + \dfrac{\cos\theta}{1 + \sin\theta} = 2$

b) $\dfrac{1 + \sin\theta}{\cos\theta} + \dfrac{\cos\theta}{1 + \sin\theta} = 2\sec\theta$

c) $(\sec\theta - \tan\theta)^2 = \dfrac{1 + \sin\theta}{1 - \sin\theta}$

d) $(\sec\theta - \tan\theta)^2 = \dfrac{1 - \sin\theta}{1 + \sin\theta}$

e) $\dfrac{\cos\theta}{\operatorname{cosec}\theta + 1} + \dfrac{\cos\theta}{\operatorname{cosec}\theta - 1} = 2\tan\theta$

(i) {a,b,d} (ii) {a,c,e} (iii) {a,b} (iv) {c,d} (v) {b,d,e}

15. Which of the following are true?

a) $\cos^3\theta + \sin^3\theta = (\sin\theta + \cos\theta)(1 - \sin\theta\cos\theta)$

b) $(\sin\theta + \cos\theta)^2 = 1 + \sin 2\theta$

c) $\dfrac{\sec\theta}{1 + \operatorname{cosec}\theta} = \dfrac{1 - \operatorname{cosec}\theta}{\sec\theta}$

d) $(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2 = 2$

e) $(\sin\theta - \cos\theta)^2 = 1 + \sin 2\theta$

f) $\cos^3\theta - \sin^3\theta = (\sin\theta + \cos\theta)(1 - \sin\theta\cos\theta)$

g) $\dfrac{\cos\theta}{1 + \sin\theta} = \dfrac{1 - \sin\theta}{\cos\theta}$

(i) {e,b} (ii) {c,a} (iii) {f,c,d} (iv) {e,g,a} (v) {a,b,d,g}

Assignment Key

1) (i)	2) (iii)	3) (iv)	4) (v)	5) (iv)	6) (iii)
7) (ii)	8) (ii)	9) (i)	10) (i)	11) (i)	12) (v)
13) (i)	14) (v)	15) (v)			