EduSahara™ Assignment

Name : Complex Trigonometric Expressions Simplification

Chapter : Trigonometry

Grade : SSC Grade X

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

(i) $\tan 2\theta$ (ii) $\sin 2\theta$ (iii) $\cos 2\theta$ (iv) $\cot 2\theta$

2. $\frac{1-\tan^2 80°}{1+\tan^2 80°} =$

(i) $\cot 160°$ (ii) $\cos 160°$ (iii) $\tan 160°$ (iv) $\sin 160°$

3. $\frac{\sin^2 80° + \sin^2 10°}{\cos^2 50° + \cos^2 40°} =$

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

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

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

5. If $\cot\theta = \frac{1}{2}$, find $\frac{(1+\sin\theta)(1-\sin\theta)}{(1-\cos\theta)(1+\cos\theta)}$

(i) $\frac{1}{4}$ (ii) $\frac{1}{2}$ (iii) $(\frac{-1}{4})$ (iv) $\frac{1}{6}$ (v) $\frac{3}{4}$

6. If $\tan\theta = \frac{2}{7}$, find $\frac{(1+\cos\theta)(1-\cos\theta)}{(1+\sin\theta)(1-\sin\theta)}$

(i) $\frac{4}{51}$ (ii) $\frac{2}{49}$ (iii) $\frac{6}{49}$ (iv) $\frac{4}{49}$ (v) $\frac{4}{47}$

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

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

8. Find the value of $7\sec^2\theta - 7\tan^2\theta$

(i) 10 (ii) 7 (iii) 0 (iv) 1 (v) 4

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

(i) 0 (ii) 3 (iii) 5 (iv) 1 (v) 2

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

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

11. If $\tan\theta + \cot\theta = 4$, find $\tan^2\theta + \cot^2\theta$

(i) 16 (ii) 15 (iii) 13 (iv) 14 (v) 12

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

(i) 7 (ii) 9 (iii) 5 (iv) 3 (v) 6

13. Which of the following are true?

a) $\frac{1 + \sin\theta}{\cos\theta} + \frac{\cos\theta}{1 + \sin\theta} = 2\sec\theta$

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

c) $\frac{\cos\theta}{\operatorname{cosec}\theta + 1} + \frac{\cos\theta}{\operatorname{cosec}\theta - 1} = 2\tan\theta$

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

e) $\frac{\cos\theta}{1 - \sin\theta} + \frac{\cos\theta}{1 + \sin\theta} = 2$

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

14. Which of the following are true?

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

b) $\frac{\sec\theta}{1+\operatorname{cosec}\theta} = \frac{1-\operatorname{cosec}\theta}{\sec\theta}$

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

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

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

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

15. If P, Q and R are the interior angles of a triangle, then $\sin(\frac{P+Q}{2}) =$

(i) $\sin(\frac{P}{2})$ (ii) $\sin R$ (iii) $\cos(\frac{R}{2})$ (iv) $\cos(\frac{P}{2})$ (v) $\sin(\frac{R}{2})$

16. If $v=\cos\theta+\sin\theta, w=\cos\theta\sin\theta$ then

(i) $v^2 = (-2w+1)$ (ii) $v^2 = (2w+1)$ (iii) $(v^2+w^2) = 1$ (iv) $(v^2+w^2) = 0$ (v) $(v^2-w^2) = 1$

17. If $t=\cos\theta+\sin\theta, u=\cos\theta-\sin\theta$ then

(i) $(t^2+u^2) = 0$ (ii) $(t^2+u^2) = 2$ (iii) $(t^2-u^2) = 1$ (iv) $(t^2+u^2) = 1$ (v) $(t^2-u^2) = 2$

18. If $e=y\cos\theta+z\sin\theta$ and $f=y\sin\theta-z\cos\theta$, then

(i) $(e^2-f^2) = (y^2-z^2)$ (ii) $(e^2+f^2) = (y^2+z^2)$ (iii) $ef = yz$ (iv) $(y^2+e^2) = (z^2+f^2)$

Assignment Key

1) (iii)	2) (ii)	3) (v)	4) (i)	5) (i)	6) (iv)
7) (iii)	8) (ii)	9) (v)	10) (iv)	11) (iv)	12) (v)
13) (iii)	14) (v)	15) (iii)	16) (ii)	17) (ii)	18) (ii)