EduSahara™ Assignment

Name : Complex Trigonometric Expressions Simplification

Chapter : Introduction to Trigonometry

Grade : CBSE Grade X

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

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

2. $\frac{1-\tan^2 20°}{1+\tan^2 20°} =$

(i) $\cot 40°$ (ii) $\sin 40°$ (iii) $\cos 40°$ (iv) $\tan 40°$

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

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

4. If $\cot\theta = \frac{2}{9}$, find $\frac{(1+\sin\theta)(1-\sin\theta)}{(1-\cos\theta)(1+\cos\theta)}$

(i) $\frac{4}{83}$ (ii) $\frac{2}{81}$ (iii) $\frac{2}{27}$ (iv) $\frac{4}{79}$ (v) $\frac{4}{81}$

5. If $\tan\theta = \frac{3}{4}$, find $\frac{(1+\cos\theta)(1-\cos\theta)}{(1+\sin\theta)(1-\sin\theta)}$

(i) $\frac{1}{2}$ (ii) $\frac{9}{14}$ (iii) $\frac{9}{16}$ (iv) $\frac{7}{16}$ (v) $\frac{11}{16}$

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

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

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

(i) 11 (ii) 0 (iii) 8 (iv) 1 (v) 5

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

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

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

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

10. Which of the following are true?

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

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

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

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

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

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

11. Which of the following are true?

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

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

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

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

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

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

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

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

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

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

13. If $y = \cos\theta + \sin\theta, z = \cos\theta \sin\theta$ then

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

14. If $q = \cos\theta + \sin\theta, r = \cos\theta - \sin\theta$ then

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

15.

a) $\frac{u^2}{v^2} = \tan^2\theta$

b) $(u+v)^2 = f^2$

c) $(u^2 - v^2) = f^2$

d) $(u^2 + v^2) = f^2$

e) $2uv = f^2 \sin 2\theta$

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

16. If $g = w\cos\theta + x\sin\theta$ and $h = w\sin\theta - x\cos\theta$, then

(i) $(w^2 + g^2) = (x^2 + h^2)$ (ii) $gh = wx$ (iii) $(g^2 - h^2) = (w^2 - x^2)$ (iv) $(g^2 + h^2) = (w^2 + x^2)$

Assignment Key

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