EduSahara™ Assignment

Name : Complex Trigonometric Expressions Simplification

Chapter : Introduction to Trigonometry

Grade : CBSE Grade X

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

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

2. $\frac{1-\tan^2 60°}{1+\tan^2 60°} =$

(i) $\cot 120°$ (ii) $\tan 120°$ (iii) $\sin 120°$ (iv) $\cos 120°$

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

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

4. If $\cot\theta = \frac{5}{7}$, find $\frac{(1+\sin\theta)(1-\sin\theta)}{(1-\cos\theta)(1+\cos\theta)}$

(i) $\frac{25}{49}$ (ii) $\frac{25}{47}$ (iii) $\frac{23}{49}$ (iv) $\frac{25}{51}$ (v) $\frac{27}{49}$

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

(i) $\frac{3}{25}$ (ii) $(\frac{-1}{25})$ (iii) $\frac{1}{27}$ (iv) $\frac{1}{25}$ (v) $\frac{1}{23}$

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

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

7. Find the value of $4\sec^2\theta - 4\tan^2\theta$

(i) 0 (ii) 2 (iii) 1 (iv) 6 (v) 4

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

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

9. 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) $\dfrac{1+\sin\theta}{1-\sin\theta}$

10. Which of the following are true?

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

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

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

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

11. Which of the following are true?

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

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

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

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

(i) $\cos(\frac{X}{2})$ (ii) $\sin(\frac{X}{2})$ (iii) $\cos(\frac{V}{2})$ (iv) $\sin(\frac{V}{2})$ (v) $\sin X$

13. If $p = \cos\theta + \sin\theta, q = \cos\theta \sin\theta$ then

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

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

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

15.

a) $2xy = e^2 \sin 2\theta$

b) $(x^2-y^2) = e^2$

c) $(x^2+y^2) = e^2$

d) $\frac{x^2}{y^2} = \tan^2\theta$

e) $(x+y)^2 = e^2$

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

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

(i) $(w^2+e^2) = (x^2+f^2)$ (ii) $(e^2+f^2) = (w^2+x^2)$ (iii) $(e^2-f^2) = (w^2-x^2)$ (iv) $ef = wx$

Assignment Key

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