

EduSahara™ Learning Center Assignment

Grade : Class X, ICSE

Chapter : Trigonometrical Identities

Name : Trigonometric Identities

1. Which of the following are true?

a) $\sin^2 \theta - \cos^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

b) $\sec^2 \theta - \tan^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

c) $\sin^2 \theta + \cos^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

d) $\operatorname{cosec}^2 \theta + \cot^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

e) $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

f) $\sec^2 \theta + \tan^2 \theta = 1$, $0 \leq \theta \leq 90^\circ$

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

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

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

3. Which of the following are true?

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

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

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

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

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

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

4. Which of the following are true?

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

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

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

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

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

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

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

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

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

(i) $v^2 = (2w + 1)$

(ii) $(v^2 - w^2) = 1$

(iii) $(v^2 + w^2) = 1$

(iv) $(v^2 + w^2) = 0$

(v) $v^2 = (-2w + 1)$

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

(i) $(t^2 - u^2) = 1$

(ii) $(t^2 - u^2) = 2$

(iii) $(t^2 + u^2) = 0$

(iv) $(t^2 + u^2) = 2$

(v) $(t^2 + u^2) = 1$

7. If $y = h \sin \theta$, $z = h \cos \theta$, then which of the following are true?

a) $(y+z)^2 = h^2$

b) $(y^2 - z^2) = h^2$

c) $\frac{y^2}{z^2} = \tan^2 \theta$

d) $2yz = h^2 \sin 2\theta$

e) $(y^2 + z^2) = h^2$

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

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

(i) $(d^2 + e^2) = (y^2 + z^2)$

(ii) $de = yz$

(iii) $(d^2 - e^2) = (y^2 - z^2)$

(iv) $(y^2 + d^2) = (z^2 + e^2)$

Assignment Key

- 1) (ii)
- 2) (ii)
- 3) (i)
- 4) (v)
- 5) (i)
- 6) (iv)
- 7) (iii)
- 8) (i)