(Sin & CSC)

S	A
T	C

Trig Identities

$\sin^2 + \cos^2 = 1$

1. If sin = 2/3 in quadrant 2, find the following

a) Cscθ

$CSC = \frac{3}{2}$

b) Cosθ

$\left(\frac{2}{3}\right)^2 + X = 1$

$-\frac{4}{9}$

$x = \sqrt{1 - \frac{4}{9}}$

$\frac{9}{9} - \frac{4}{9} = \sqrt{\frac{5}{9}} = -\frac{\sqrt{5}}{3}$

c) Tanθ

$\frac{\sin x}{\cos x} = \frac{2}{3} \div -\frac{\sqrt{5}}{3} \rightarrow \frac{2}{3} \times -\frac{3}{\sqrt{5}} = -\frac{6 \cdot \sqrt{5}}{3\sqrt{5} \cdot \sqrt{5}} = -\frac{6\sqrt{5}}{15}$

k C F

2. If cos= 4/5 in quadrant 4, find the following

S	A
T	C

(Cos & sec)

a) Secθ

$Sec = \frac{5}{4}$

b) Sin

$\sin^2 + \left(\frac{4}{5}\right)^2 = 1$

$-\frac{16}{25} \rightarrow$

$-\frac{16}{25}$

$\sin^2 x = \sqrt{1 - \frac{16}{25}}$

$\frac{25}{25} - \frac{16}{25} = \sqrt{\frac{9}{25}}$

$\sin = -\frac{3}{5}$

c) Cotθ

$\frac{\cos x}{\sin x} \rightarrow \frac{4}{5} \div -\frac{3}{5}$

k C F

$\frac{4}{5} \times -\frac{5}{3} = -\frac{20}{15} = \frac{-4}{3}$

Trig Identities

3. $\sec\theta \times \cos\theta$

$$\frac{1}{\cos\theta} \times \frac{\cos\theta}{1} = \boxed{1}$$

4. $\cot\theta \div \csc\theta$

$$\frac{\cos x}{\sin} \div \frac{1}{\sin x}$$

$$\frac{\cos x}{\sin x} \times \frac{\sin x}{1} = \boxed{\cos x}$$

5. $\sin^2\theta \div \sin\theta\cos\theta$

$$\frac{\sin^2\theta}{\sin\theta\cos\theta} = \frac{\sin\theta}{\cos\theta} = \boxed{\tan\theta}$$

6. $\tan\theta \times \csc\theta \div \sec\theta$

$$\frac{\tan\theta \cdot \csc\theta}{\sec\theta} \qquad \frac{\sin\theta}{\cos\theta} \cdot \frac{1}{\sin\theta} = \frac{1}{\cos} = \sec\theta$$

$$\frac{\sec\theta}{\sec\theta} = \boxed{1}$$

7. $\cot\theta \times \tan\theta$

$$\cot\theta \cdot \tan\theta$$

$$\frac{\cos\theta}{\sin\theta} \cdot \frac{\sin\theta}{\cos\theta} = \boxed{1}$$

Trig Identities

8. $\tan^2\theta \div \sec^2\theta$

$$\frac{\sin^2\theta}{\cos^2\theta} \div \frac{1}{\cos^2\theta}$$

K C F

$$\frac{\sin^2\theta}{\cos^2\theta} \times \frac{\cos^2\theta}{1} = \sin^2\theta$$

9. $\sec\theta \times \sin\theta \div \tan\theta$

$$\frac{\frac{1}{\cos}\cdot\frac{\sin}{1}}{\frac{\sin}{\cos}} = \frac{\sin}{\cos} = \boxed{1}$$

10. $\sin^2\theta - \cot\theta \times \tan\theta \div \cot\theta \times \sin\theta$

$$\frac{\sin^2\theta\boxed{-1\cot\theta\cdot\tan\theta}}{\cot\theta\cdot\sin\theta}$$

Reciprocals

$$-\frac{\cos}{\sin}\cdot\frac{\sin}{\cos} = -1$$

$(\sin^2\theta - 1)$ take out -1

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

$$\cot\theta\cdot\sin\theta$$

$$\hookrightarrow \frac{\cos\theta}{\sin\theta}\cdot\frac{\sin\theta}{1}$$

Identity

$$\cos^2 = 1 - \sin^2 x$$

$$\rightarrow -1(\cos^2 x)$$

$$\frac{-1(\cos^2\theta)}{\cos\theta}$$

$$\boxed{-1\cos\theta}$$