

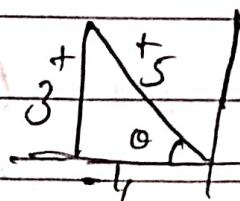
Q. If $\sin \alpha = 3/5$, α lies in second quadrant, find all other t-functions.

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

$$= 1 - 9/25 = \frac{25-9}{25} = \frac{16}{25}$$

$$\cos \alpha = \sqrt{16/25}$$

$$\cos \alpha = \pm \frac{4}{5}$$



2nd quadrant $\cos \alpha$ is -ve.

$$25 - 9 = 16$$

$$\cos \alpha = -4/5$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{3/5}{-4/5} = -3/4$$

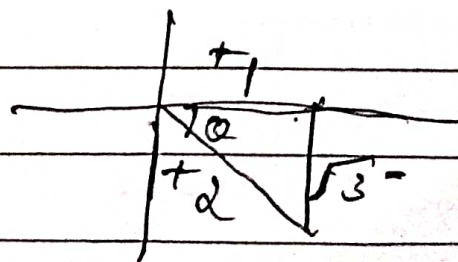
$$\sec \alpha = -4/3, \csc \alpha = \frac{1}{\sin \alpha} = 5/3$$

$$\csc \alpha = 1/\sin \alpha = 5/3$$

Q. If $\cos \alpha = 1/2$, α lies in fourth quadrant, find all other t-functions.

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

$$= 1 - 1/4 = 3/4$$



$$\sin \alpha = \pm \sqrt{3}/2$$

α lies in fourth quadrant

$\sin \alpha$ is -ve in fourth quadrant

$$\sin \alpha = -\sqrt{3}/2$$

$$\tan \alpha = -\sqrt{3}, \quad \cot \alpha = -1/\sqrt{3}$$

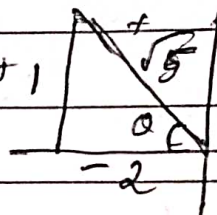
$$\operatorname{cosec} \alpha = -2/\sqrt{3} \quad \text{and} \quad \sec \alpha = 2//$$

Q. If $\cot \alpha = 3/2$, α lies in 2nd quadrant find all other t-functions

$$1 + \cot^2 \alpha = \operatorname{cosec}^2 \alpha = +1$$

$$\operatorname{cosec}^2 \alpha = 1 + 4/9 = 5$$

$$\operatorname{cosec} \alpha = \pm \sqrt{5}$$



In 2nd quadrant $\operatorname{cosec} \alpha$ is +ve.

$$\operatorname{cosec} \alpha = \underline{\underline{\sqrt{5}}}$$

$$\sin \alpha = 1/\sqrt{5}, \quad \tan \alpha = -1/2$$

$$\text{Ans. } \sec^2 \alpha = 1 + 1/4 = 5/4$$

$$\sec \alpha = \pm \sqrt{5}/2$$

$\sec \alpha$ is -ve in 2nd quadrant

$$\sec \alpha = -\sqrt{5}/2$$

$$\therefore \cos \alpha = -2/\sqrt{5}$$

Trigonometric Ratios of Allied Angles (Related angles).

Table of result

$$1. \begin{aligned} \sin(-\theta) &= -\sin\theta \\ \cos(-\theta) &= +\cos\theta \\ \tan(-\theta) &= -\tan\theta \end{aligned} \quad 2. \begin{aligned} \sin(90-\theta) &= +\cos\theta \\ \cos(90-\theta) &= +\sin\theta \\ \tan(90-\theta) &= +\cot\theta \end{aligned}$$

$$3. \begin{aligned} \sin(90+\theta) &= +\cos\theta \\ \cos(90+\theta) &= -\sin\theta \\ \tan(90+\theta) &= -\cot\theta \end{aligned} \quad 4. \begin{aligned} \sin(180-\theta) &= +\sin\theta \\ \cos(180-\theta) &= -\cos\theta \\ \tan(180-\theta) &= -\tan\theta \end{aligned}$$

$$5. \begin{aligned} \sin(180+\theta) &= -\sin\theta \\ \cos(180+\theta) &= -\cos\theta \\ \tan(180+\theta) &= +\tan\theta \end{aligned} \quad 6. \begin{aligned} \sin(270-\theta) &= -\cos\theta \\ \cos(270-\theta) &= -\sin\theta \\ \tan(270-\theta) &= +\cot\theta \end{aligned}$$

$$7. \begin{aligned} \sin(270+\theta) &= -\cos\theta \\ \cos(270+\theta) &= +\sin\theta \\ \tan(270+\theta) &= -\cot\theta \end{aligned} \quad 8. \begin{aligned} \sin(360-\theta) &= -\sin\theta \\ \cos(360-\theta) &= +\cos\theta \\ \tan(360-\theta) &= -\tan\theta \end{aligned}$$