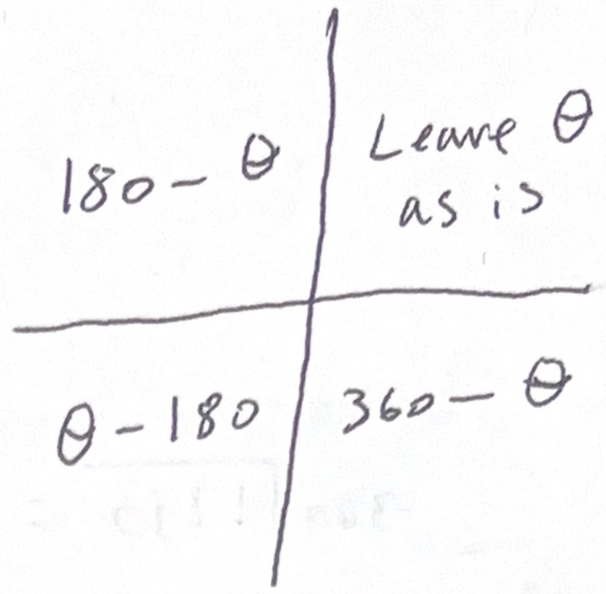
Reference Angles



1. Find the three major trigonometric functions of 135°

QII 180 − 135 = 45°

Sin135° = 45° Cos135° = 45° Tan135° = 45°

Value: $\sin 45° = \frac{\sqrt{2}}{2}$ $\cos 45° = \frac{\sqrt{2}}{2}$ $\tan 45° = 1$

2. Find the three trigonometric functions of 240°

QIII 240 − 180 = 60°

Sin240° = 60° Cos240° = 60° Tan240° = 60°

Value: $\sin 60° = \frac{\sqrt{3}}{2}$ $\cos 60° = \frac{1}{2}$ $\tan = \sqrt{3}$

3. Find the three trigonometric functions of 330°

QIV 360 − 330 = 30°

Sin330° = 30° Cos330° = 30° Tan330° = 30°

Value: $\sin 30° = \frac{1}{2}$ $\cos 30° = \frac{\sqrt{3}}{2}$ $\tan 30° = \frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$

4. Find the Reference angles for 45°, 260°, 170°, and 345°

QI 45° = 45° QIII 260 − 180° = 120° QII 180 − 170 = 10°

QIV 345 = 15°

360 − 345 = 15°

Special Angles

1. Find the exact three major trig functions for an angle of 1740°

$360\overline{)1740} = 4.83$ $\quad 1740 - 1440 = 300^\circ$ Q IV

$360 \times 4 = 1440$ $\quad 360 - 300 = 60^\circ$

$\sin = 60^\circ \quad \cos = 60^\circ \quad \tan = 60^\circ \rightarrow \sin 1740^\circ = \frac{\sqrt{3}}{2} \quad \cos 1740^\circ = \frac{1}{2}$

$\tan 1740^\circ = \sqrt{3}$

2. Find the exact three major trig functions for an angle of 840°

$360\overline{)840} = 2$ $\quad 840 - 720 = 120$ QII

$180 - 120 = 60^\circ$

$360 \times 2 = 720$

$\sin = 60^\circ \quad \cos = 60^\circ \quad \tan = 60^\circ \rightarrow \sin 840^\circ = \frac{\sqrt{3}}{2} \quad \cos 840^\circ = \frac{1}{2} \quad \tan 840^\circ = \sqrt{3}$

3. Find the exact three major trig functions for an angle of 405°

$405 - 360 = 45^\circ$ QI

$\sin = 45^\circ \quad \cos = 45^\circ \quad \tan = 45^\circ \rightarrow \sin 405^\circ = \frac{\sqrt{2}}{2} \quad \cos 405^\circ = \frac{\sqrt{2}}{2} \quad \tan 405^\circ = 1$

4. Find the exact three major trig functions for an angle of 1035°

$360\overline{)1035} = 2$ $\quad 360 \times 2 = 720$

$1035 - 720 = 315$ QIV $\quad 360 - 315 = 45^\circ$

$\sin = 45^\circ \quad \cos = 45^\circ \quad \tan = 45^\circ \rightarrow \sin 1035^\circ = \frac{\sqrt{2}}{2} \quad \cos 1035^\circ = \frac{\sqrt{2}}{2}$

$\tan 1035^\circ = 1$

5. Calculate $\cos^2(135°) + 2\sin(30°) - \tan(45°)$

$\cos^2(135^\circ)$

QII $\rightarrow \cos =$ (negative)

$180 - 135 = 45^\circ$

so, $\cos = -\frac{\sqrt{2}}{2}$

$\sin 30 = \frac{1}{2} \quad \tan 45 = 1$

$\left(-\frac{\sqrt{2}}{2}\right)^2 + 2\left(\frac{1}{2}\right) - 1$

$\left(-\frac{\sqrt{2}}{2} \cdot -\frac{\sqrt{2}}{2}\right) + \left(\frac{2}{1} \cdot \frac{1}{2}\right) - 1$

$\frac{2}{4}$ or $\frac{1}{2} + 1 - 1 = \frac{1}{2}$