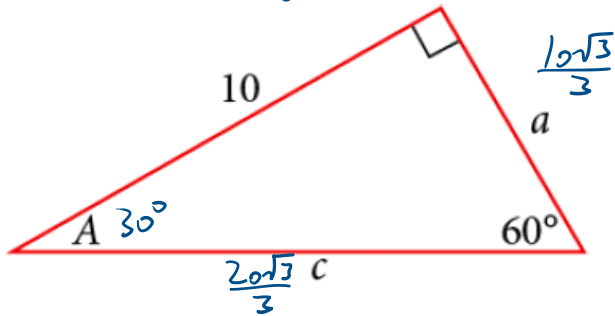


eg. Solve the triangle



Sol: $\angle A = 180^\circ - 90^\circ - 60^\circ$
 $= \boxed{30^\circ}$

$$\tan 30^\circ = \frac{a}{10}$$

$$10 \cdot \frac{\sqrt{3}}{3} = \frac{a}{10}$$

$$\boxed{\frac{10\sqrt{3}}{3}} = a$$

$$\cos 30^\circ = \frac{10}{c}$$

$$\frac{\sqrt{3}}{2} = \frac{10}{c}$$

$$\sqrt{3} \cdot c = 2 \cdot 10$$

$$\sqrt{3}c = 20$$

$$10^2 + \left(\frac{10\sqrt{3}}{3}\right)^2 = c^2$$

$$100 + \frac{(10\sqrt{3})^2}{3^2} = c^2$$

$$100 + \frac{100 \cdot 3}{3} = c^2$$

$$100 + \frac{100}{1} = c^2$$

$$\frac{300}{3} + \frac{100}{3} = c^2$$

$$= c^2$$

$$\frac{400}{3} = c^2$$

$$\pm \frac{20}{\sqrt{3}} = c$$

$$\frac{\sqrt{3} \cdot 20}{\sqrt{3} \cdot \sqrt{3}} = c$$

$$\boxed{\frac{20\sqrt{3}}{3}} = c$$

$$c = \frac{20}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$c = \boxed{\frac{20\sqrt{3}}{3}}$$

VI. Cofunction Identity

$$\sin A = \cos(90^\circ - A)$$

$$\cos A = \sin(90^\circ - A)$$

$$\tan A = \cot(90^\circ - A)$$

← " $\sin 30^\circ = \frac{1}{2} = \cos 60^\circ$ "

← use these to help remembering:

eg. $\sin 30^\circ = \cos 60^\circ$

eg. $\cos 30^\circ = \sin 60^\circ$

eg. $\tan 30^\circ = \cot 60^\circ$

eg. $\sin 9^\circ$

$$= \cos(90^\circ - 9^\circ)$$

$$= \cos 81^\circ$$

$$\approx \boxed{0.16}$$

eg. $\cot 76^\circ$

$$= \tan(90^\circ - 76^\circ)$$

$$= \tan 14^\circ$$

$$\approx \boxed{0.25}$$

Similarly, we have

$$\begin{aligned} \sec A &= \csc(90^\circ - A) \\ \csc A &= \sec(90^\circ - A) \\ \cot A &= \tan(90^\circ - A) \end{aligned}$$

← then, $\sec A = \frac{1}{\cos A}$

eg. $\sec 47^\circ$

$$= \csc(90^\circ - 47^\circ) \quad \Bigg| \quad = \frac{1}{\cos 47^\circ}$$

$$= \csc 43^\circ \quad \Bigg| \quad = \frac{1}{\sin(90^\circ - 47^\circ)}$$

$$= \frac{1}{\sin 43^\circ} \quad \Bigg| \quad = \frac{1}{\sin 43^\circ}$$

$$\approx \frac{1}{0.682} \quad \Bigg| \quad \approx \frac{1}{0.682}$$

$$\approx \boxed{1.47} \quad \Bigg| \quad \approx \boxed{1.47}$$

eg. Solve for A: $\cos(A+4^\circ) = \sin(3A+2^\circ)$

Sol: Since $\cos A = \sin(90^\circ - A)$ copy

$$\sin(90^\circ - (A+4^\circ)) = \sin(3A+2^\circ)$$

$$90^\circ - (A+4) = 3A + 2^\circ \quad \leftarrow \text{easy alg. eqn.}$$

$$90^\circ - A - 4^\circ = 3A + 2^\circ$$

$-2^\circ \qquad -2^\circ$

$$90^\circ - A - 6^\circ = 3A$$

$$84^\circ - A = 3A$$

$+A \quad +A$

$$\frac{84^\circ}{4} = \frac{4A}{4}$$

$$\boxed{21^\circ} = A$$

eg. Solve for t: $\tan(2t) = \cot(t-60^\circ)$.

Sol: Since $\tan A = \cot(90^\circ - A)$,

$$\cot(90^\circ - 2t) = \cot(t - 60^\circ)$$

$$90^\circ - 2t = t - 60^\circ$$

$+60^\circ \qquad +60^\circ$

$$150^\circ - 2t = t$$

$+2t \quad +2t$

$$50^\circ = 3t$$

$\leftarrow \cot * = \cot *$

tttgt

$$50^\circ \times 50^\circ = \frac{3t}{3}$$

$$\boxed{50^\circ} = t$$