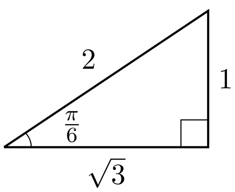
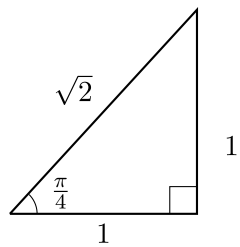
Trig Functions:

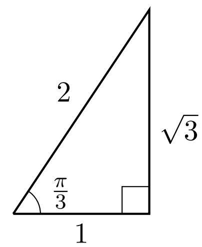
$$\sin(x) = \frac{\text{opposite}}{\text{hypotenuse}} \qquad \cos(x) = \frac{\text{adjacent}}{\text{hypotenuse}} \qquad \tan(x) = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sec(x) = \frac{\text{hypotenuse}}{\text{adjacent}} \qquad \csc(x) = \frac{\text{hypotenuse}}{\text{opposite}} \qquad \cot(x) = \frac{\text{adjacent}}{\text{opposite}}$$

Standard Triangles:







Trig Identities:

- Other 4 trig functions written in terms of $\sin(x)$ & $\cos(x)$

$$\tan(x) = \frac{\sin(x)}{\cos(x)} \qquad \sec(x) = \frac{1}{\cos(x)} \qquad \csc(x) = \frac{1}{\sin(x)} \qquad \cot(x) = \frac{\cos(x)}{\sin(x)}$$

- Pythagorean identities

$$\sin^2(x) + \cos^2(x) = 1 \qquad \tan^2(x) + 1 = \sec^2(x) \qquad 1 + \cot^2(x) = \csc^2(x)$$

- Double angle identities

$$\sin(2x) = 2\sin(x)\cos(x) \qquad \cos(2x) = \cos^2(x) - \sin^2(x)$$

- Power reducing identities

$$\sin^2(x) = \frac{(1 - \cos(2x))}{2} \qquad \cos^2(x) = \frac{(1 + \cos(2x))}{2}$$

You can derive the power reducing identities from the double angle identity for cosine:

$$\cos(2x) = \cos^2 x - \sin^2 x$$

If you want the identity involving $\sin^2(x)$, replace $\cos^2(x)$ with $1 - \sin^2(x)$.

$$\begin{aligned} \cos(2x) &= \cos^2 x - \sin^2 x \\ &= \left(1 - \sin^2 x\right) - \sin^2 x \\ &= 1 - 2\sin^2 x \end{aligned}$$

Solve for $\sin^2 x$:

$$\begin{aligned} \cos(2x) &= 1 - 2\sin^2 x \\ 2\sin^2 x &= 1 - \cos(2x) \\ \sin^2 x &= \frac{1 - \cos(2x)}{2} \end{aligned}$$

If you want the identity involving $\cos^2(x)$, replace $\sin^2(x)$ with $1 - \cos^2(x)$ and follow a similar process.