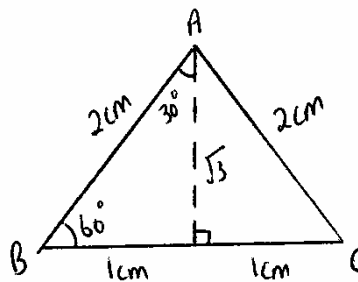


Finding Exact Values of Trigonometric Ratios

How to find 30° and 60° angles

Take an equilateral triangle with sides 2cm
(you could do this with any equilateral triangle)



$$AD = \sqrt{2^2 - 1^2}$$

$$AD = \sqrt{3} \text{ cm}$$

$$\therefore \sin 30^\circ = \frac{1}{2}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

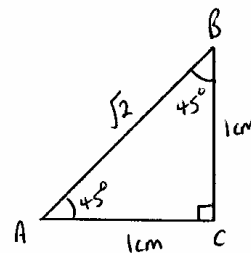
$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$

$$\tan 60^\circ = \sqrt{3}$$

How to find a 45° angle

Take an isosceles right angled triangle with sides 1cm
(again you can use any isosceles triangle)



$$AB = \sqrt{1^2 + 1^2}$$

$$AB = \sqrt{2} \text{ cm}$$

$$\therefore \sin 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

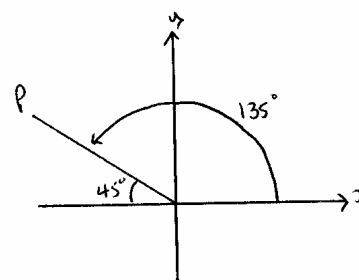
$$\tan 45^\circ = \frac{1}{1} = 1$$

Example 1.

Find the exact value of $\sin 135^\circ$

$$\sin 135^\circ = \sin 45^\circ \quad \text{sin is positive in 2nd quadrant}$$

$$= \frac{\sqrt{2}}{2}$$

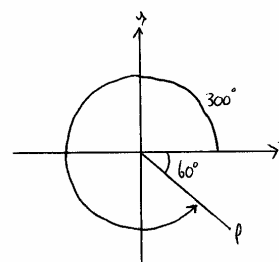


Example 2.

Find the exact value of $\tan 300^\circ$

$$\tan 300^\circ = -\tan \theta \quad \text{tan is negative in 4th quadrant}$$

$$= -\tan 60^\circ$$



Remember to first work out the value of θ , then work out whether the quadrant is positive or negative.

