

Special Triangles

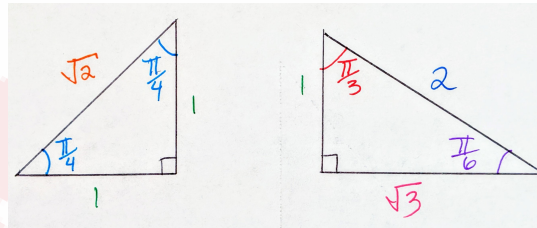
**Raise My**  
**MArks**

RaiseMyMarks.com

2021

## Special Triangles

The trigonometric ratios are based on a general right angled triangle with general angles. Now, if we consider specific angles, now we are dealing with specific right angles triangles, or **special triangles**. There are two **special triangles** based on three special angles. The three specific angles are  $\pi/4$  and  $\pi/6, \pi/3$ . Let's have a look at these two special triangles.



The first special triangle is a right angled triangle with internal angles  $45^\circ = \pi/4$  and sides 1, 1 and hypotenuse  $\sqrt{2}$ . We have the following trigonometric values for the angles  $45^\circ = \pi/4$ ,

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

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

$$\tan 45^\circ = 1$$

The second special triangle has angles  $60^\circ = \pi/3$  and  $30^\circ = \pi/6$  with sides of length  $\sqrt{3}$  and 1 and hypotenuse length 2. From this triangle we have the following trigonometric values:

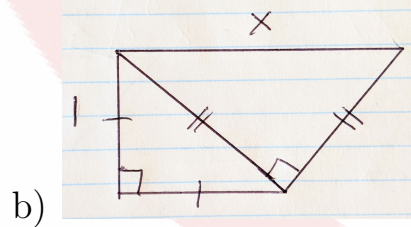
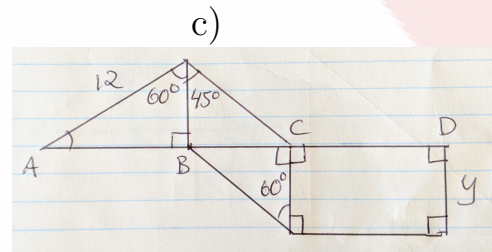
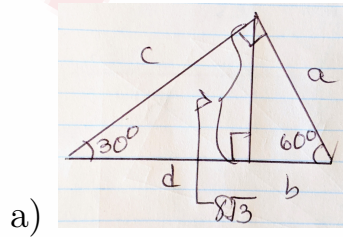
$$\sin 60^\circ = \frac{\sqrt{3}}{2}, \quad \sin 30^\circ = \frac{1}{2}$$

$$\cos 60^\circ = \frac{1}{2}, \quad \cos 30^\circ = \frac{\sqrt{3}}{2}$$

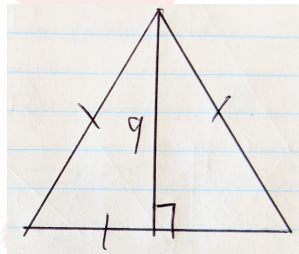
$$\tan 60^\circ = \sqrt{3}, \quad \tan 30^\circ = \frac{1}{\sqrt{3}}$$

## Exercises

1. Find the unknowns in the following triangles,

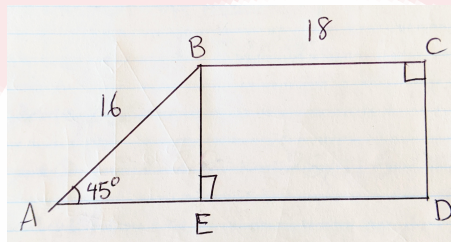


2. The altitude of the equilateral triangle below is 9. Find the perimeter.



3. The area of the following figure is given by,

$$\text{Area} = \frac{1}{2}h(b_1 + b_2)$$



Find  $h$ ,  $b_1$  and  $b_2$  and then find the area of the figure.

4. For the following parallelogram, find  $\overline{BD}$ .

