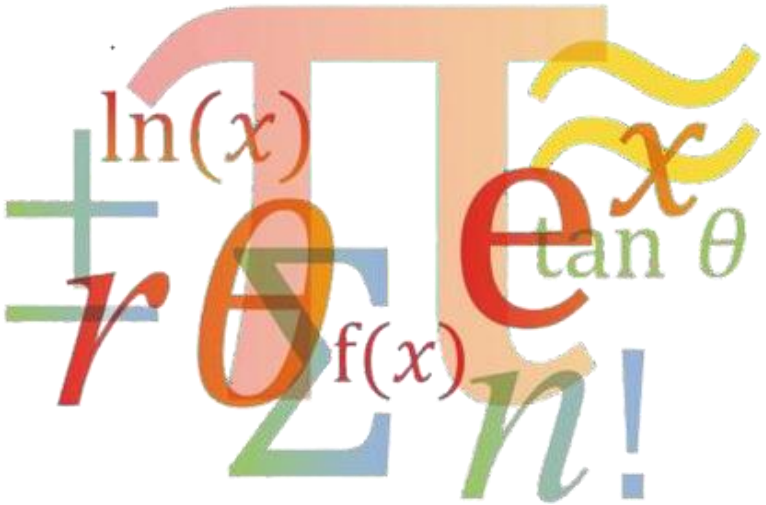
Cambridge Assessment International Education

CORE

Trigonometry /Sine and Cosine ratios/



Starter

Use a calculator to find the value of:

1. Sin 90°
2. Cos 50°
3. Tan 54°
4. Cos 135.8°
5. Sin 127.2°
6. Cos 28.7°
7. Tan 5°
8. Sin 41.7°
9. Cos 78.8°
10. Tan 68.3°

Lesson Outcomes

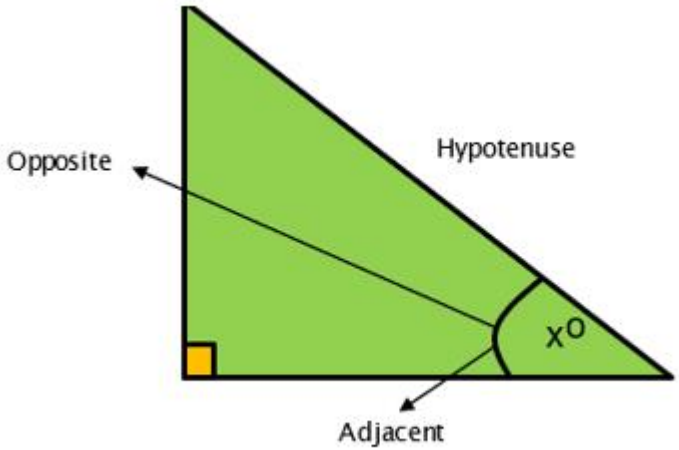
- To form an equation from a trigonometry triangle

- To find a missing side of a right-angled triangle

Labeling the sides

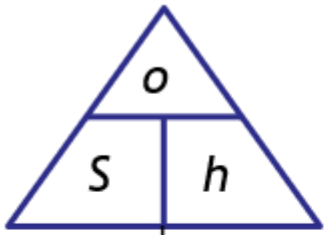
The adjacent side is the side opposite the named angle

The hypotenuse is directly opposite the right-angle

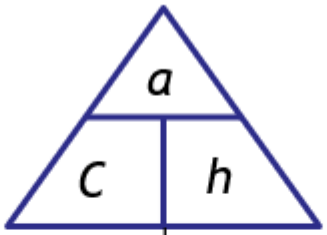


The adjacent side is the side with both the right-angle and the named angle on

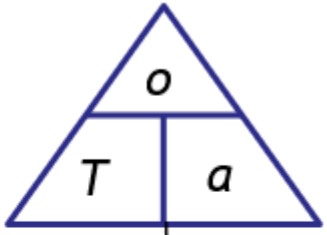
SohCahToa



$\text{Sin}x^{o} = \frac{\text{Opposite}}{\text{Hypotenuse}}$

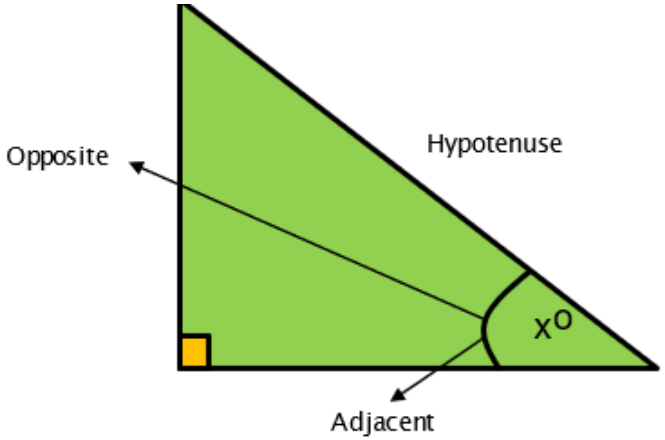


$\text{Cos}x^{o} = \frac{\text{Adjacent}}{\text{Hypotenuse}}$



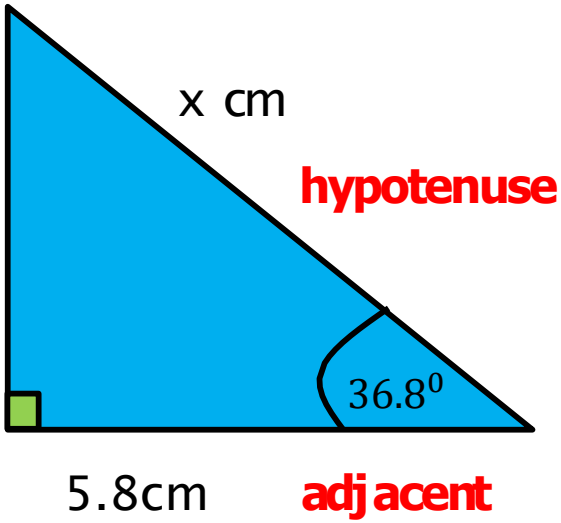
$\text{Tan}x^{o} = \frac{\text{Opposite}}{\text{Adjacent}}$

Use on right-angled triangles only!



Example 1

$$Cosx^0 = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$



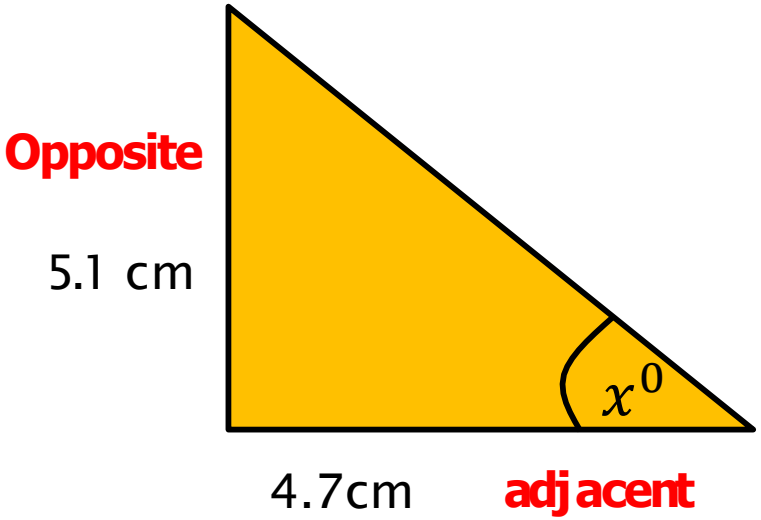
$$\text{Cos } 36.8^0 = \frac{5.8}{x}$$

$$x = \frac{5.8}{\text{Cos } 36.8^0}$$

$$Answer \quad x = 7.24\,cm \quad (3.sf)$$

Example 2

$$\text{Tan}x^{o} = \frac{\text{Opposite}}{\text{Adjacent}}$$



$$tanx = \frac{5.1}{4.7}$$

$$tanx = 1.085106\ldots$$

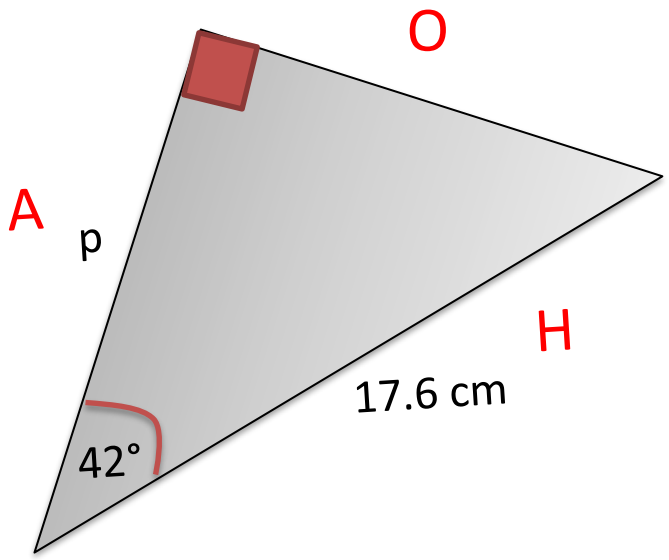
On your calculator:

Shift $x = tan^{-1}(1.085106)$

$$Answer \quad x = 47.3^0 \quad (1.dp)$$

Example 3

Find the length of side p



$Cosx^0 = \frac{\text{Adjacent}}{\text{Hypotenuse}}$

$Cosx^0 = \frac{adj}{hyp}$

$$cos42^0 = \frac{p}{17.6}$$

$$p = 17.6 \times cos42^0$$

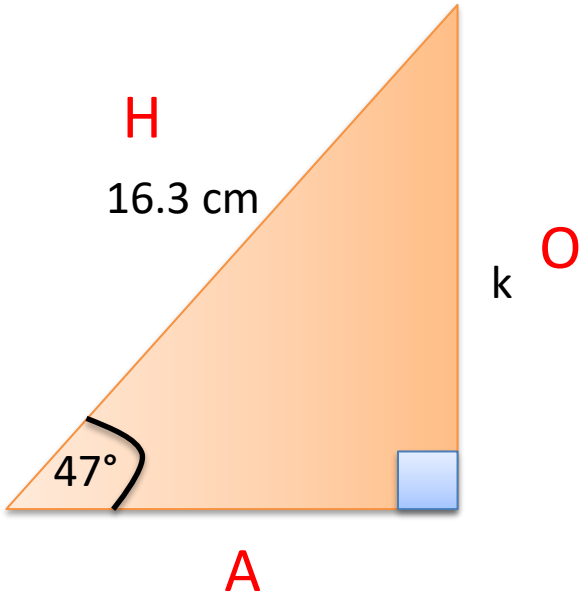
$$p = 13.1\ cm$$

Example 4

$$sinx = \frac{Opposite}{Hypotenuse}$$

$$\text{Sin}x = \frac{Opp}{hyp}$$

Find the length of side k



$$sin47^0 = \frac{k}{16.3}$$

$$k = 16.3 \times sin47^0$$

$$k = 11.9 \ cm \quad (3.sf)$$