Trigonometry (F)

(a) Work out the value of x.

\[ \cos 50^\circ = \frac{x}{4} \]
\[ x = 4 \cos 50^\circ \]
\[ x = 2.57115 \ldots \]
\[ x = 2.6 \text{ cm} \]

Give your answer to 1 decimal place.

(b) Work out the value of x.

\[ 2.8 \text{ cm} [3] \]

2. Here are sketches of four triangles.

In each triangle
the longest side is exactly 1 cm
the other length is given to 2 decimal places.

(a) Circle the value of \( \cos 50^\circ \)
to 2 decimal places.

\[ \cos = \frac{adj}{hyp} \]
\[ \frac{0.77}{0.64} \]
\[ \frac{0.53}{0.86} \]
\[ = \frac{0.64}{1} \]

Work out the size of the angle marked \( x \).
Give your answer correct to 1 decimal place.

\[ x = 20.9^\circ \]

[1]
4. (a) Work out the size of angle $x$.

$$\cos x = \frac{a}{h} = \frac{8}{11}$$

$$x = \cos^{-1} \left( \frac{8}{11} \right) = 43.3^\circ \text{ (to 1dp)}$$  [2]

(b) Work out length $y$.

$$\tan(40^\circ) = \frac{y}{37}$$

$$y = 37 \times \tan(40^\circ)$$

$$y = 31.04668\ldots$$

$$y = 31 \text{ cm (to nearest cm)}$$  [2]

5. A man is working out the height of a vertical tree.

The man is able to measure the angle of elevation of the top of the tree from his measuring instrument.

The measuring instrument is 1.8m above ground level.

When the man is standing 19m from the base of the tree, the angle he measures is 56°.

A sketch of this situation is shown below.

$$\tan(56^\circ) = \frac{h}{19}$$

$$h = 28.1686\ldots$$

$$h = 28.2 \text{ m (to 1dp)}$$

Height of tree = 28.2 + 1.8

$$= 30.0 \text{ m (to 1dp)}$$  [4]

Calculate the full height of the tree.

6. Given that $\sin 30^\circ = 0.5$,

work out the value of $x$. (NON CALCULATOR PAPER)

$$\sin 30^\circ = \frac{x}{12}$$

$$0.5 = \frac{x}{12}$$

so, $x = 6 \text{ cm}$  [2]

7. These two right-angled triangles are similar.

a) Write down the value of $\tan x$. Give your answer as a fraction.

$$\tan x = \frac{3}{4}$$  [1]

b) Work out the value of $y$.

$$\frac{3}{4} = \frac{18}{6}$$

$$y = 6 \times \frac{3}{4}$$

$$y = 18 \frac{3}{4} = 9.5 \text{ cm}$$

$$y = 4.5 \text{ cm}$$  [2]