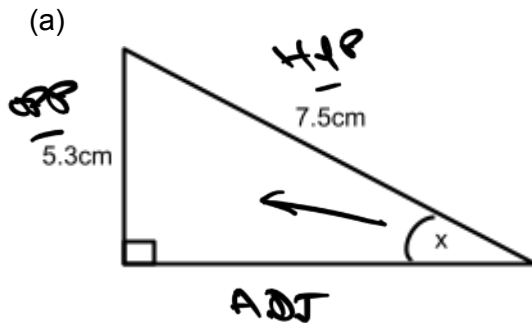# QT SohCahToa

Calculator

1. Work out the size of the angle marked with an x in each of the triangles shown. Give your answers correct to 3 significant figures.
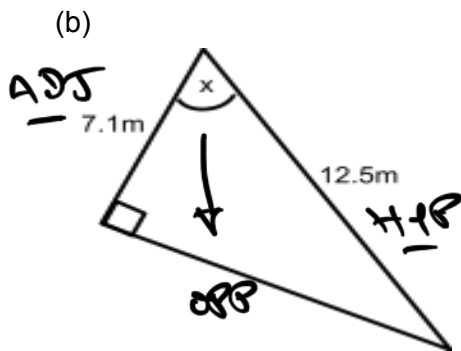
(a)

Soh Cah Toa

$$\sin x = \frac{5.3}{7.5}$$

$$\sin^{-1}\left(\frac{5.3}{7.5}\right) = 44.964$$

$$= 45.0° \ (3sf)$$

(2 marks)

(b)

Soh Cah Toa

$$\cos x = \frac{7.1}{12.5}$$

$$\cos^{-1}\left(\frac{7.1}{12.5}\right) = 55.389$$

$$= 55.4° \ (3sf)$$

(2 marks)

(c)
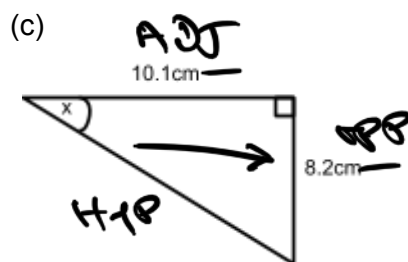
Soh Cah Toa

$$\tan x = \frac{8.2}{10.1}$$

$$\tan^{-1}\left(\frac{8.2}{10.1}\right)$$

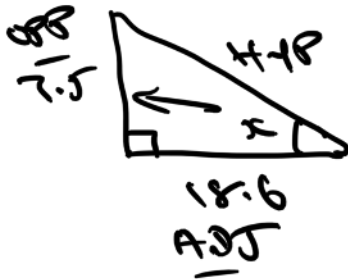$$= 39.072 \quad = 39.1°$$

(2 marks)

QT SohCahToa

Calculator

2. A zip line ride is constructed by tying the top of a metal rope, to a vertical mast of height 7.5m. When the metal rope is pulled taut, the distance of the end of the rope to the base of the mast is 18.6m. Work out the angle between the ground and the zip line.
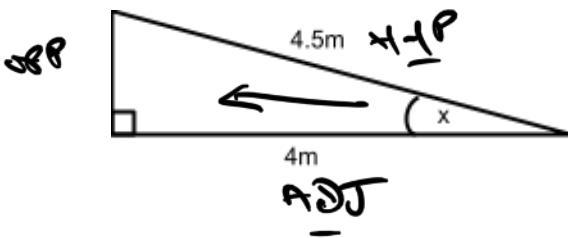Give your answer to 1 decimal place.   (3 marks)

Soh Cah Toa

$$\tan x = \frac{7.5}{18.6}$$

$$\tan^{-1}\left(\frac{7.5}{18.6}\right) = 21.9605$$

$$= 22.0° \ (1dp)$$

3. The diagram shows the roof of a block of flats. In order to make sure there is enough space for an air conditioning system, the angle x will need to be a minimum of 22°. Can the air conditioning system be correctly fitted? Give a reason for your answer.   (3 marks)
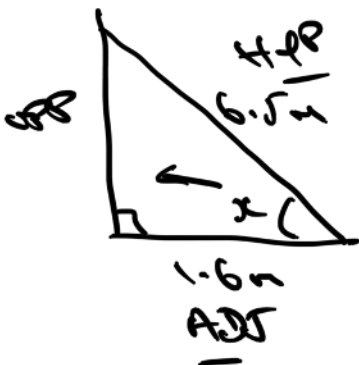
Soh Cah Toa

$$\cos x = \frac{4}{4.5}$$

$$\cos^{-1}\left(\frac{4}{4.5}\right) = 27.266°$$

Yes, more than 22°

4. A 6.5m ladder is placed against a wall. To be safe, it must be inclined at between 70° and 80° to the ground. The ladder is placed 1.6m from the base of the wall. Is the ladder safe to use?   (3 marks)

Soh Cah Toa

$$\cos x = \frac{1.6}{6.5}$$

$$\cos^{-1}\left(\frac{1.6}{6.5}\right) = 75.7499°$$
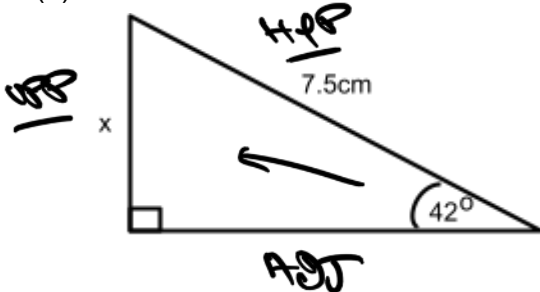
Yes between 70° – 80°

QT SohCahToa

Calculator

5. Work out the length of the side marked with an x in each of the triangles shown. Give your answers correct to 3 significant figures.
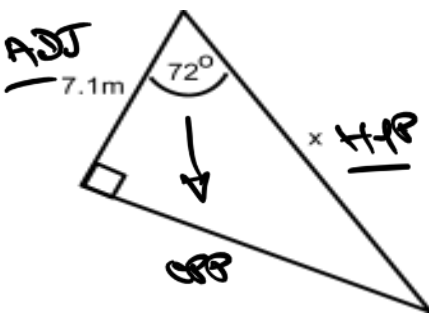
(a)

HYP
7.5cm

OPP

x

42°

ADJ

Soh Cah Toa

$\sin 42° = \dfrac{OPP}{7.5}$

$5.01847 = OPP$

$5.02cm \ (3 sf)$

(2 marks)

(b)

ADJ
7.1m

72°

x HYP

OPP

Soh Cah Toa

$x \ HYP \ \cos 72° = \dfrac{7.1}{HYP} \quad x \ HYP$

$HYP = \dfrac{7.1}{\cos 72°} = 22.936$

(2 marks)

$= 23.0m \ (3 sf)$

(c)

ADJ
x

27°

17.2cm

HYP

OPP

Soh Cah Toa

$\cos 27° = \dfrac{ADJ}{17.2}$

$15.3253 = ADJ$

$15.3cm \ (3 sf)$

(2 marks)

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QT SohCahToa

Calculator

6. A ladder is 5.5m long. The ladder rests against the vertical side of a house, with the foot of the ladder resting on horizontal ground. The angle between the ladder and the horizontal ground is 65°. How far does the ladder reach up the wall? Give your answer correct to 3 significant figures.   (3 marks)

Soc Cac Toa

$Sin 65° = \frac{OPP}{5.5}$

$4.9846 = OPP$
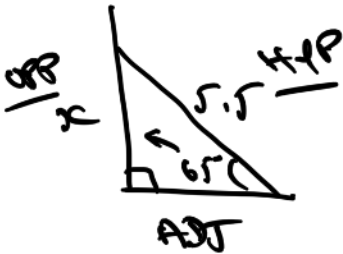
$4.98 m \ (3 sf)$

7. The diagram shows an equilateral triangle with sides of 8m. Calculate the height of the triangle. Give your answer correct to 3 significant figures.   (3 marks)

height

8m

Soc Cac Toa
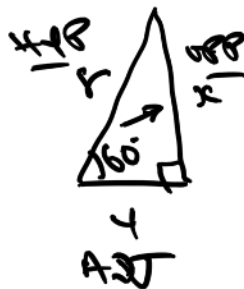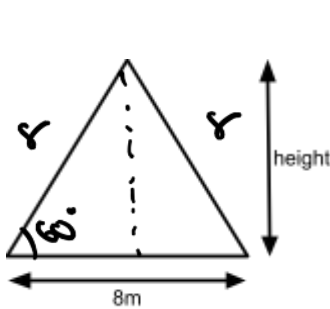
$Sin 60° = \frac{OPP}{8}$

$6.9282 = OPP$

$6.93 m \ (3 sf)$

8. A zip line of length 100m is fastened to the top of a tower. At the point where the zip line meets the ground, the angle of elevation to the top of the tower is 36°. How far is the zip line from the base of the tower? Give your answer to 1 decimal place.

(3 marks)

Soc Cac Toa
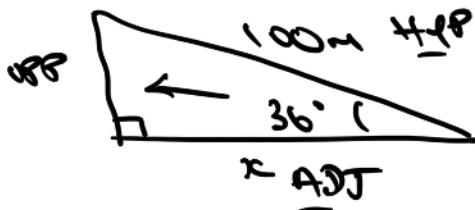
$Cos 36° = \frac{ADJ}{100}$

$Cos 36° \times 100 = ADJ$

$80.901 m = ADJ$

$80.9 m.$