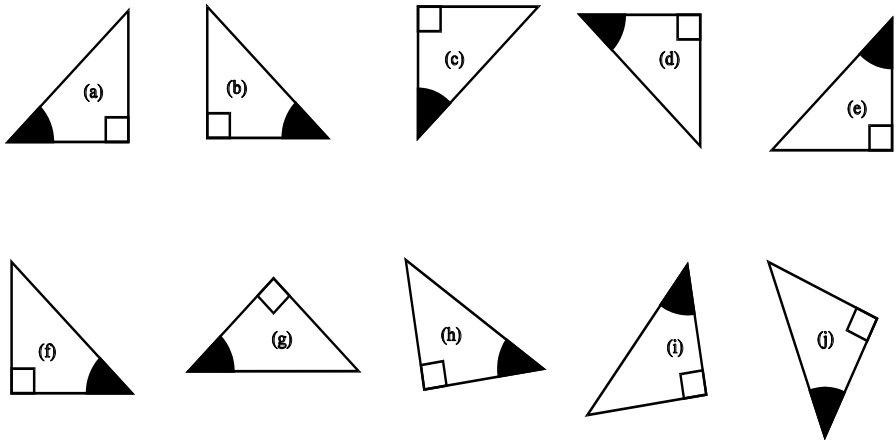
Trigonometry

Exercise 1

1) Copy each of the triangles below into your jotter.

On each triangle mark **H** for the hypotenuse and by looking at the 'marked' angle write **O** on the opposite side and **A** on the adjacent side.



2) For the following angles find correct to 3 decimal places:

a) sin 20° **b)** sin 61° **c)** sin 9° **d)** sin 64° **e)** sin 27°

f) cos 54° **g)** cos 5° **h)** cos 84° **i)** cos 7° **j)** cos 29°

k) tan 43° **l)** tan 36° **m)** tan 59° **n)** tan 48° **o)** tan 71°

p) sin 34° **q)** tan 89° **r)** cos 25° **s)** tan 18° **t)** sin 37°

u) tan 24° **v)** cos 84° **w)** sin 35° **x)** tan 58° y) cos 47°

3) Find the size of angle x (correct to 1 decimal place) for

a) $\tan x = 1{\cdot}505$ **b)** $\tan x = 0{\cdot}789$ **c)** $\tan x = 0{\cdot}231$ **d)** $\tan x = 79{\cdot}456$

e) $\tan x = 10{\cdot}271$ **f)** $\tan x = 2{\cdot}512$ **g)** $\tan x = 0{\cdot}120$ **h)** $\tan x = 34{\cdot}512$

i) $\tan x = 1{\cdot}276$ **j)** $\tan x = 6{\cdot}014$

4) Find the size of angle x (correct to 1 decimal place) for

a) $\cos x = 0{\cdot}124$ **b)** $\cos x = 0{\cdot}927$ **c)** $\cos x = 0{\cdot}013$ **d)** $\cos x = 0{\cdot}523$

e) $\cos x = 0{\cdot}453$ **f)** $\cos x = 0{\cdot}758$ **g)** $\cos x = 0{\cdot}213$ **h)** $\cos x = 0{\cdot}398$

i) $\cos x = 0{\cdot}812$ **j)** $\cos x = 0{\cdot}090$

5) Find the size of angle x (correct to 1 decimal place) for

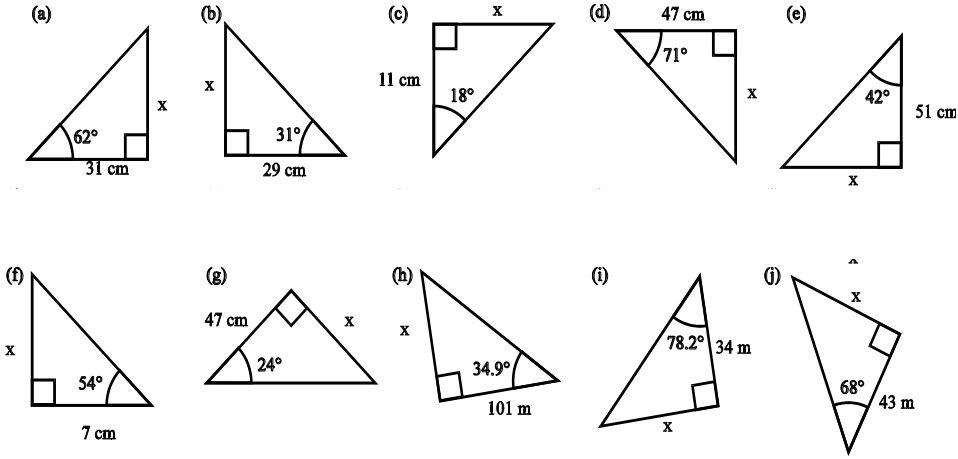
a) $\sin x = 0{\cdot}841$ **b)** $\sin x = 0{\cdot}724$ **c)** $\sin x = 0{\cdot}132$ **d)** $\sin x = 0{\cdot}523$

e) $\sin x = 0{\cdot}423$ **f)** $\sin x = 0{\cdot}390$ **g)** $\sin x = 0{\cdot}568$ **h)** $\sin x = 0{\cdot}235$

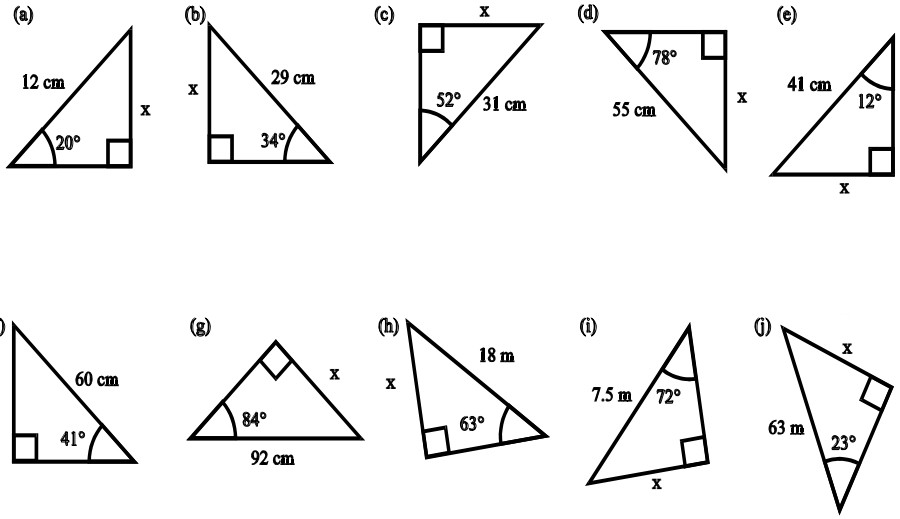
i) $\sin x = 0{\cdot}398$ **j)** $\sin x = 0{\cdot}612$

Exercise 2

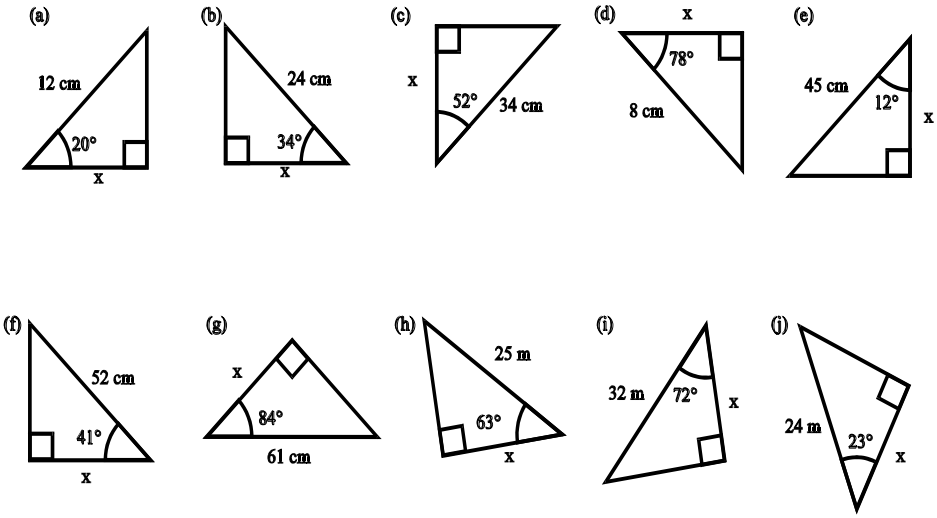
1) Find the length of the side marked **x**. **(TANGENT)**



2) Find the length of the side marked **x**. **(SINE)**

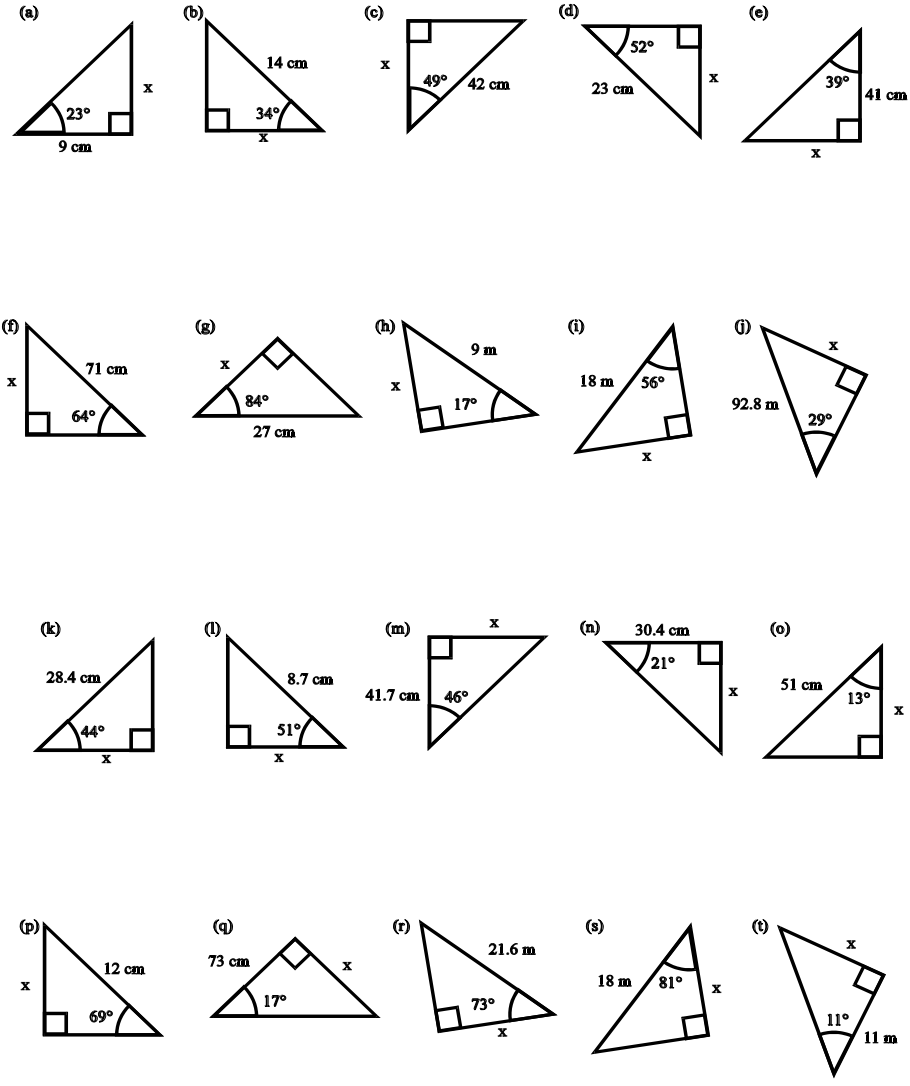


3) Find the length of the side marked **x**. **(COSINE)**



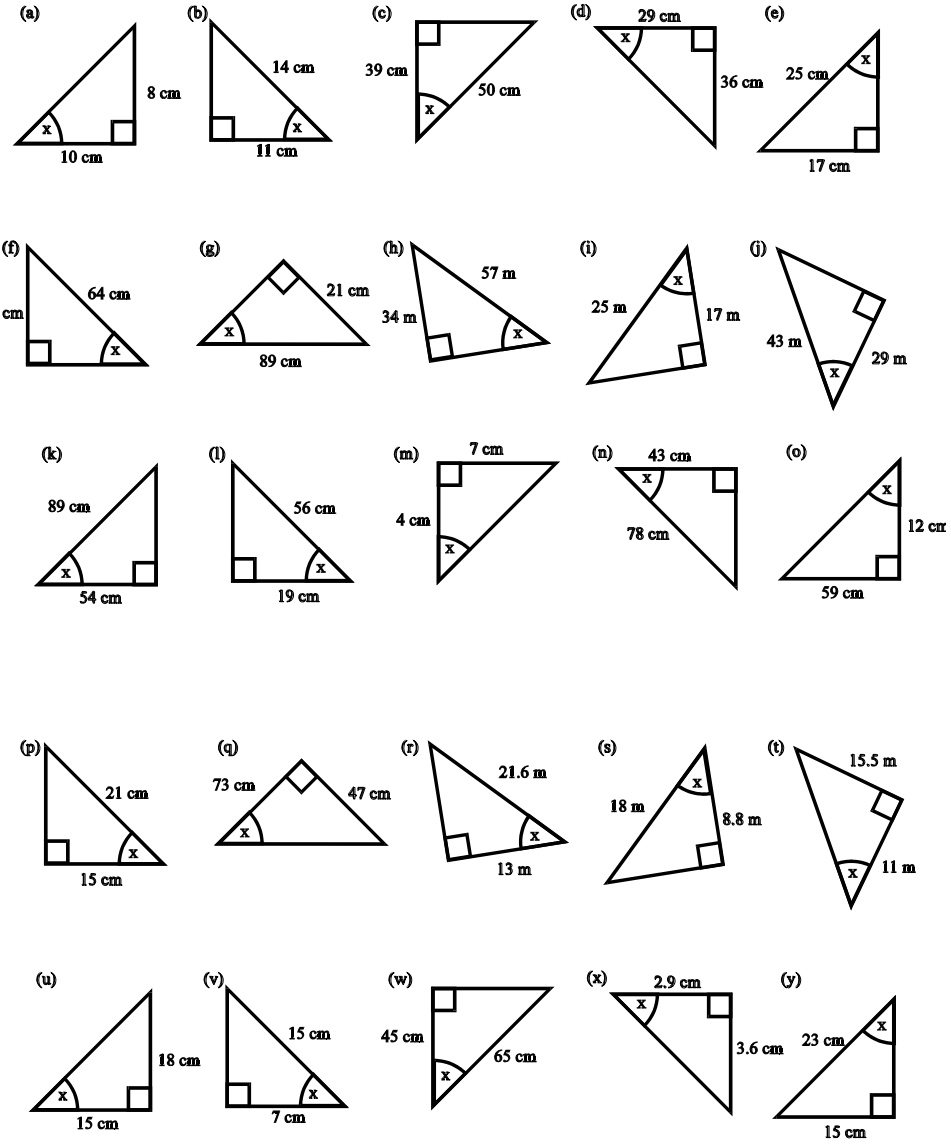
Exercise 3

Find the length of the side marked **x**. **(MIXED)**



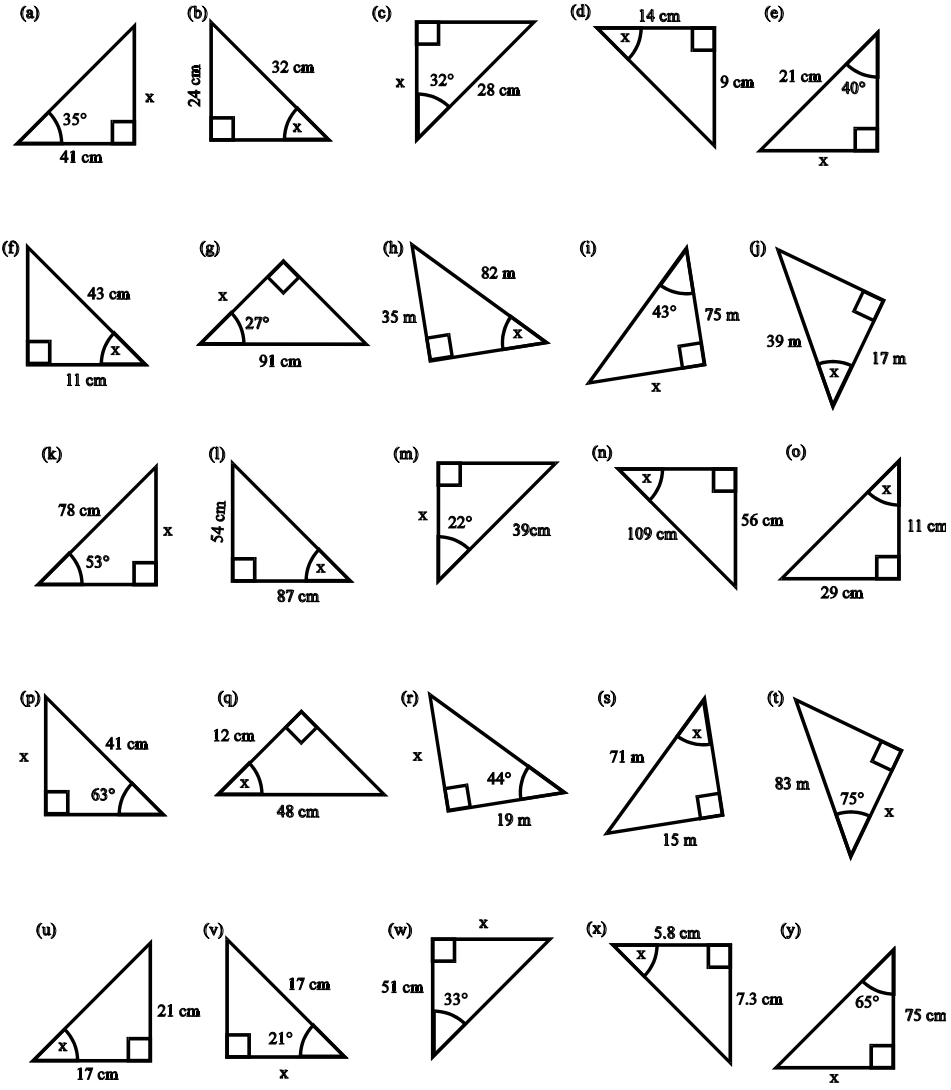
Exercise 4

Find the size of the angle marked **x** in each triangle



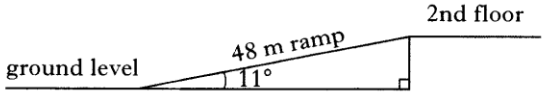
Exercise 5

Find the size of **x** in each triangle.



Exercise 6

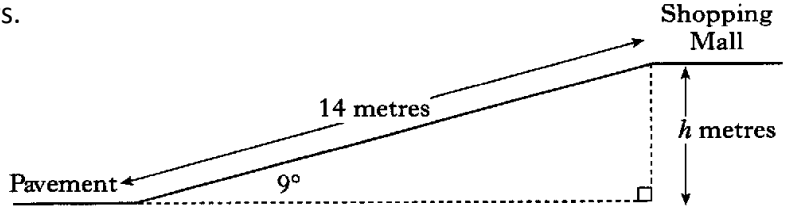
1) A ramp is fitted at a school to allow disabled access to the second floor of the building



The ramp is 48 m long and is at an angle of 11° to the horizontal.

What is the height of the second floor above the ground?

2) The diagram shows a shop's ramp for customers who are wheelchair users.

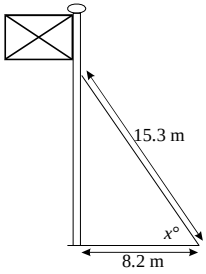


It connects the pavement to the level of the shopping mall.

The ramp is 14 metres long and slopes at an angle of 9°, as shown.

Calculate the difference in height, h metres, between the pavement and the shopping mall.
Give your answer correct to the nearest metre.

3) The diagram shows a flagpole which is supported by a wire which is fixed to the ground 8·2 metres from the base of the flagpole.



The wire is 15·3 metres long.

a) Calculate the angle marked $x°$ between the wire and the ground.

b) For safety reasons the angle should be less than 60°.

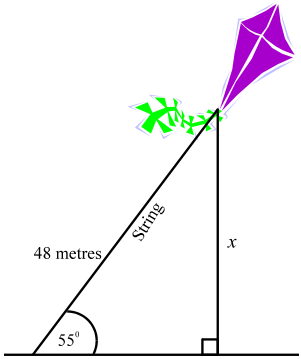
Can the angle of the wire be considered safe?

4) Sam is flying a kite.

The string is 48 metres long.

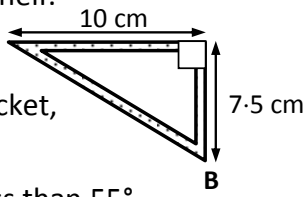
How high is the kite above the ground?

(marked $\boldsymbol{x}$ in the diagram)



5) A triangular bracket is designed to support a shelf.

Its length is 10 cm and its height is 7·5 cm.



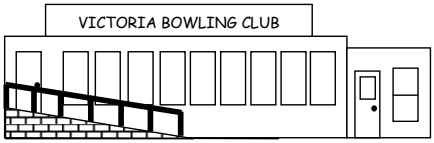
a) Calculate the angle at the base of the bracket, angle B.

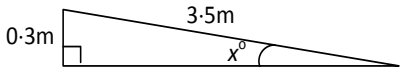
b) For safety reasons the angle should be less than 55°.

Can the angle of the wire be considered safe?

6) A ramp has been constructed at a bowling club. It is 3·5metres long and rises through 0·3metres.

Calculate the angle, x, that the ramp makes with the horizontal.





7) A boy flying a kite lets out 200 m of string which makes an angle of 72° with the horizontal. What is the height of the kite?

8) A ladder is 15 m long. The top rests against the wall of a house, and the foot rests on level ground 2 m from the wall.

Calculate the angle between the ladder and the ground.

9) A ladder 12 m long is set against the wall of a house and makes an angle of 75° with the ground.

a) How far up the wall will the ladder reach?

b) How far is the foot of the ladder from the wall?

10) A telegraph pole standing on horizontal ground is 9 m high, and is supported by a wire 10 m long fixed to the top of the pole and to the ground. Calculate:

a) the angle between the wire and the ground.

b) the distance of the point on the ground from the foot of the pole.