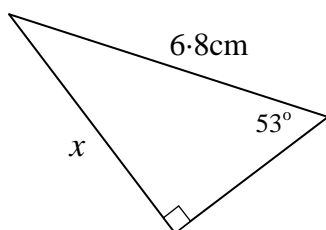## Calculating a side in a right-angled triangle
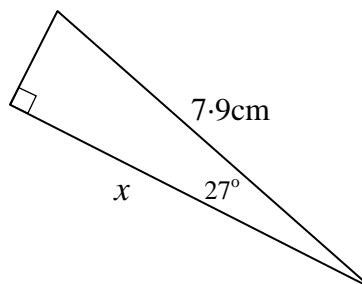
1.   Calculate the length of the side marked *x* in each diagram below. *Show all your working*.
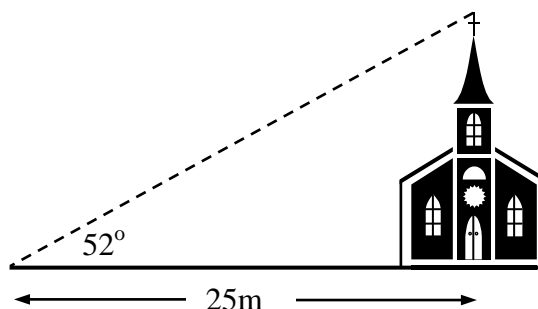
   (a)   **(b)**

   6·8cm

   53°

   x

                                                            7·9cm   [3, 3]
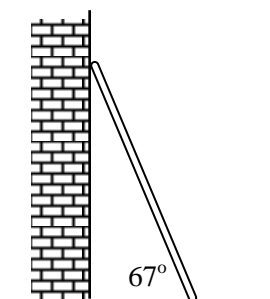
                                                            x   27°

2.   Jenny is standing 25 metres away
      from the bottom of a church tower.
      She looks up at the top at an
      angle of elevation of 52°.
      Calculate the height of the tower.   52°   [3]

                                                      25m

3.   A ladder, which is 6·4 metres long, leans against a vertical wall and makes an angle
      of 67° with the ground.

                                                      67°
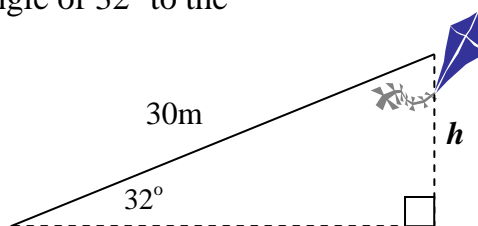
      Calculate, to the nearest 0·1m, how far the bottom of the ladder is from the wall.   [3]

4.   Eddie is flying his kite. The string is at an angle of 32° to the
      horizontal.

      He lets out 30 metres of string.   30m

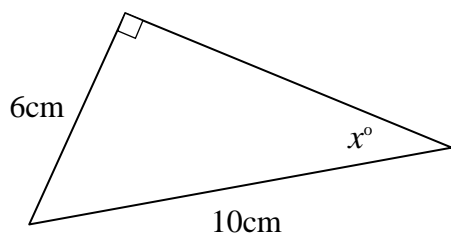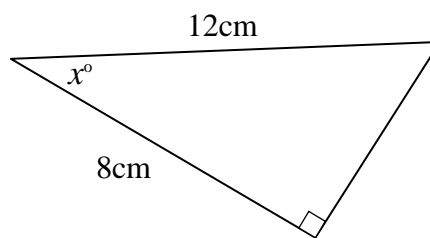   *h*

      How high is the kite above
      the ground?   32°   [3]

                                                            [15 marks]

Calculating an angle in a right-angled triangle
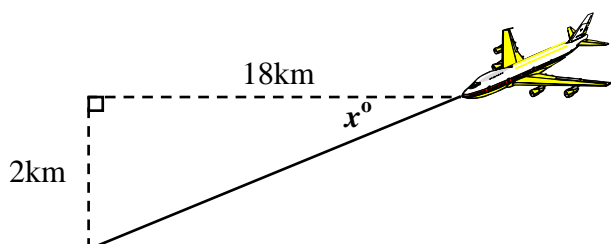
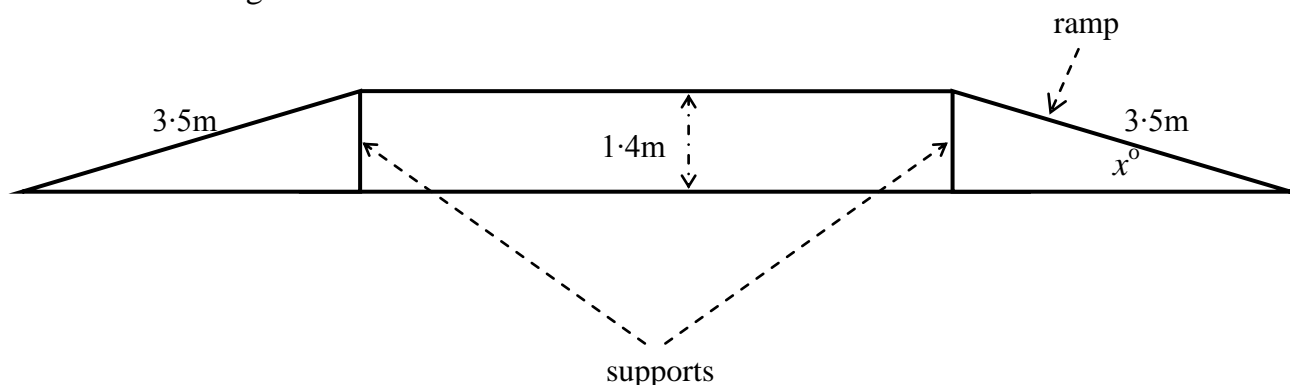**1.** Calculate the size of the angle marked x^o in these right-angled triangles. [3, 3]

(a)

6cm

10cm

x^o

(b)

12cm

x^o

8cm

2. An aircraft making a steady descent decreases height by 2km in 18km. What is the angle of descent, x^o ? [3]

18km

x^o

2km

3. In a woodland walk there is a bridge over a stream.

The diagram shows the side view of it.

ramp

3·5m

1·4m

3·5m

x^o

supports

The ramps at the side are 3·5metres long and the supports are 1·4 metres high.

To be safe the angle that the ramp makes with the ground should be between 21° and 23°.
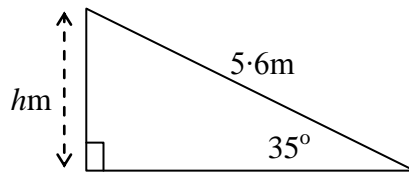
Are the ramps on the bridge safe?

You must show all working and give a reason for your answer. [5]
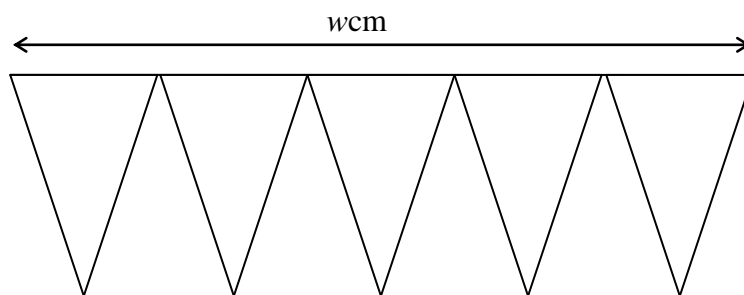
[16 marks]

Mixed Examples

1. The staircase in my house is 5·6metres long and rises at a angle of 35° to the floor.
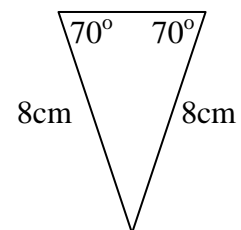
*h*m

5·6m

35°

Calculate the height , '*h*m', of the staircase. [3]

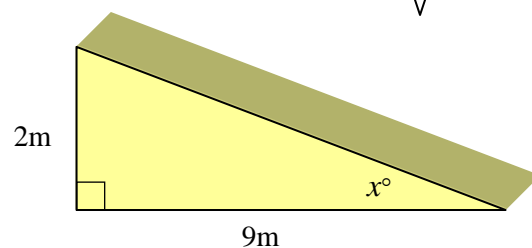**2.** The pattern in the diagram is formed from a series of isosceles triangles in a line.

*w*cm

70° 70°

8cm 8cm

Each triangle has its equal sides 8cm long and its equal angles70^o.

Calculate the width, *w*cm, of the pattern. [4]

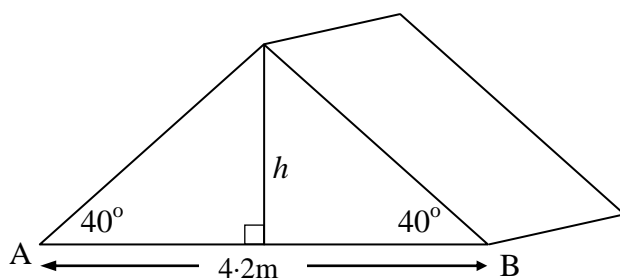**3.** A skateboard ramp has been designed with the dimensions as shown.

2m

x^o

9m

The ramp can only be used in competitions if the angle marked *x* is between 10 and 15 degrees.

Can this ramp be used in a competition?   **You must show all your working.** [5]

4. The distance between the tent pegs at A and B is 4·2m and the angle of elevation of the sides of the tent is 40°, as shown.

Calculate the height, *h*, of the tent.

[3]

h

40° 40°

A 4·2m B

[15 marks]