

Trigonometry Revision 11CMM

Exercise 6K Pages 137-138

Exercise 6L Page 140-141

From Blue textbooks kept  
on shelves at back of

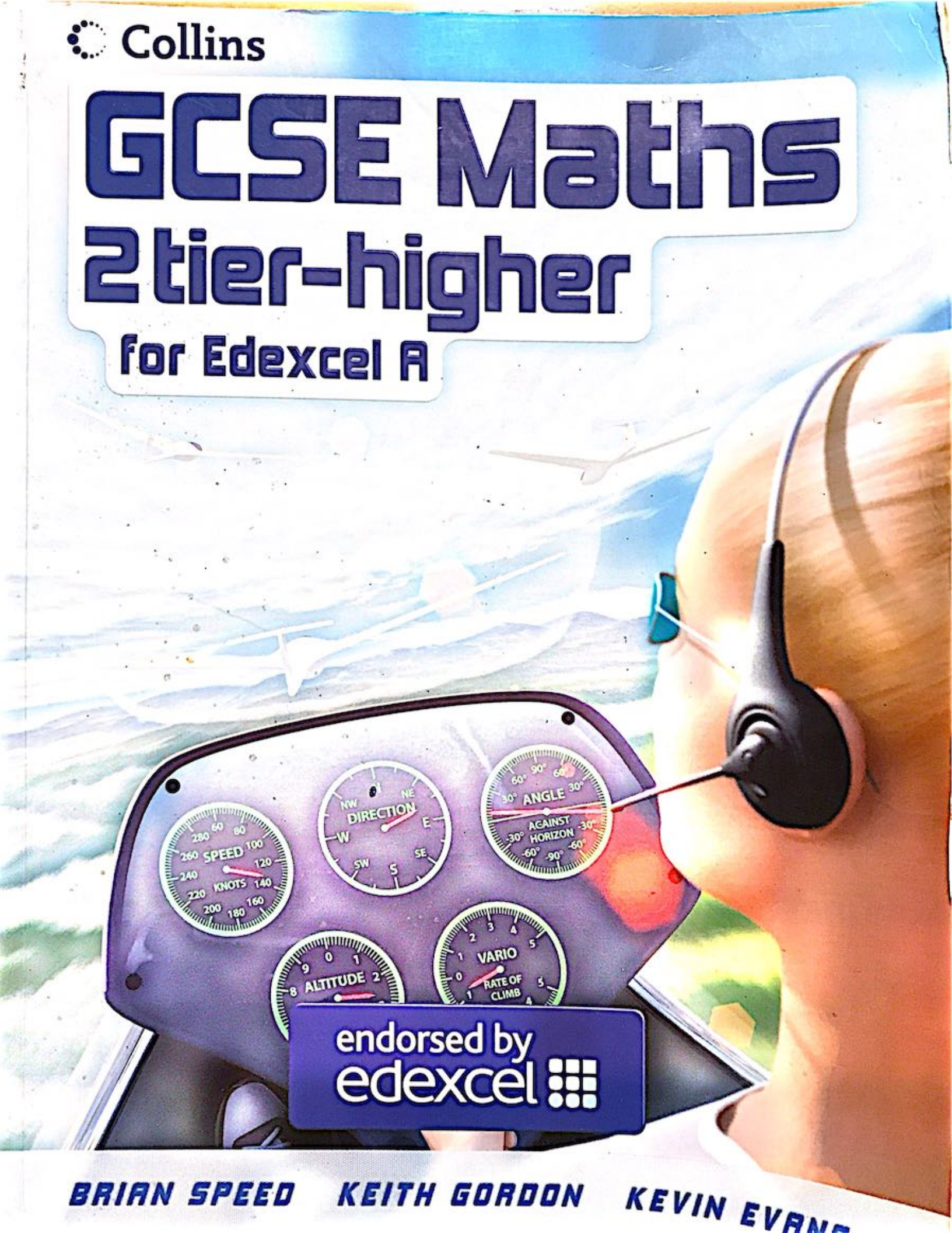
M34

 Collins

# GCSE Maths

## 2 tier-higher

for Edexcel A



endorsed by  
edexcel 

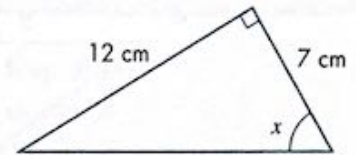
**BRIAN SPEED**

**KEITH GORDON**

**KEVIN EVANS**

**EXAMPLE 24**

Find the angle marked  $x$  in this triangle.

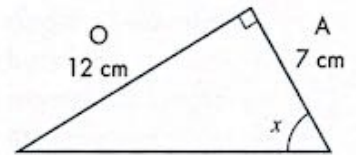


Mark on the triangle the sides you know.

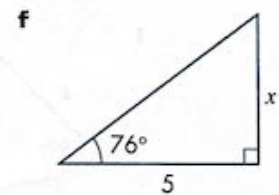
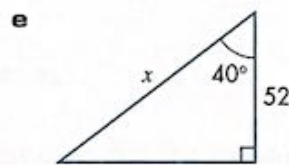
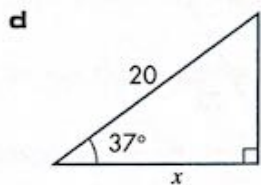
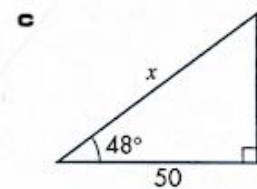
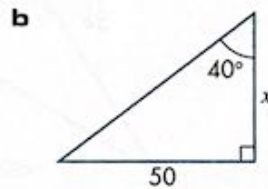
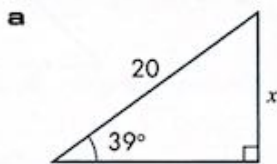
Recognise it is a **tangent** problem because you have  $O$  and  $A$ .

$$\text{So } \tan x = \frac{12}{7}$$

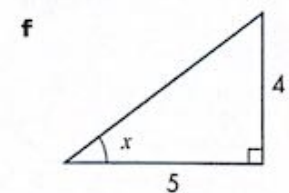
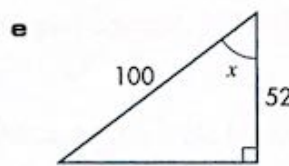
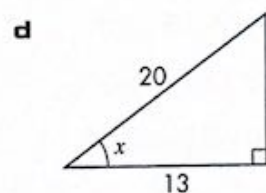
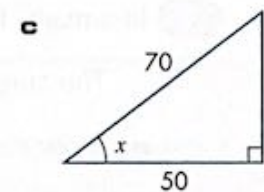
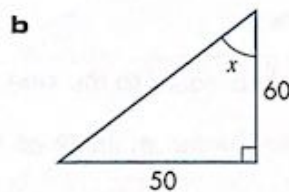
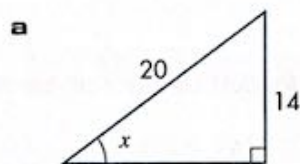
$$x = \tan^{-1} \frac{12}{7} = 59.7^\circ \text{ (1 decimal place)}$$

**EXERCISE 6K**

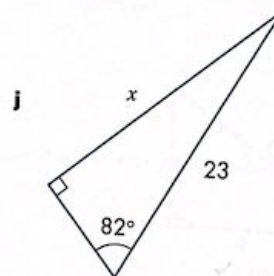
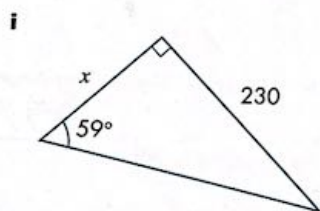
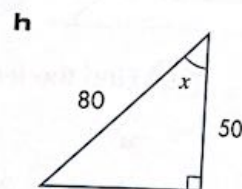
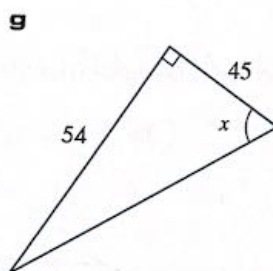
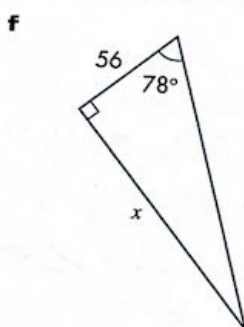
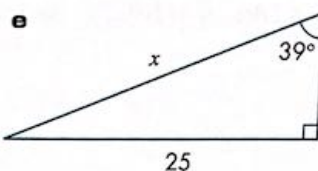
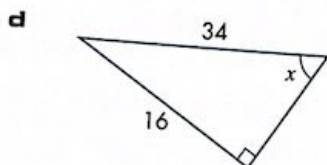
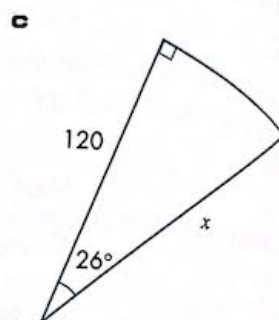
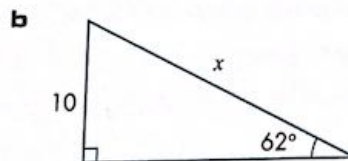
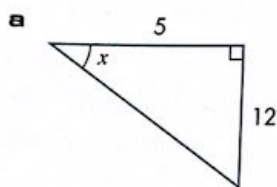
**1** Find the length marked  $x$  in each of these triangles.



**2** Find the angle marked  $x$  in each of these triangles.



3 Find the angle or length marked  $x$  in each of these triangles.

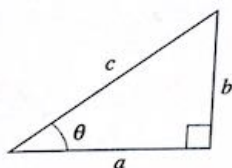


**PROOF**

4 In a maths textbook it says:

*The tangent of any angle is equal to the sine of the angle divided by the cosine of the angle.*

- a Show clearly that this is true for an angle of  $30^\circ$ .
- b Prove, by using the definitions of  $\sin \theta$  and  $\cos \theta$ , that the statement is true for this right-angled triangle.



## EXERCISE 6L

In these questions, give answers involving angles to the nearest degree.



- 1 A ladder, 6 m long, rests against a wall. The foot of the ladder is 2.5 m from the base of the wall. What angle does the ladder make with the ground?



- 2 The ladder in question 1 has a "safe angle" with the ground of between  $60^\circ$  and  $70^\circ$ . What are the safe limits for the distance of the foot of the ladder from the wall?



- 3 Another ladder, of length 10 m, is placed so that it reaches 7 m up the wall. What angle does it make with the ground?



- 4 Yet another ladder is placed so that it makes an angle of  $76^\circ$  with the ground. When the foot of the ladder is 1.7 m from the foot of the wall, how high up the wall does the ladder reach?

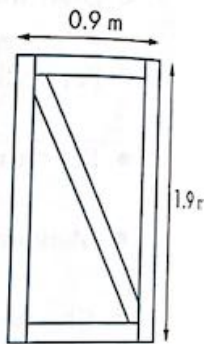


- 5 Calculate the angle that the diagonal makes with the long side of a rectangle which measures 10 by 6 cm.



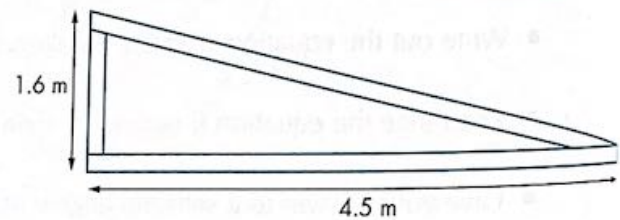
- 6 This diagram shows a frame for a bookcase.

- What angle does the diagonal strut make with the long side?
- Use Pythagoras' theorem to calculate the length of the strut.

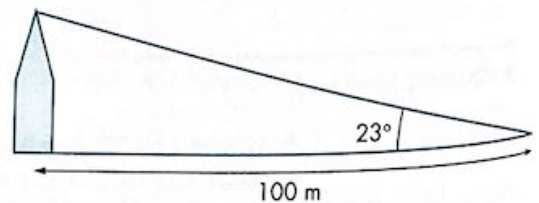


- 7 This diagram shows a roof truss.

- What angle will the roof make with the horizontal?
- Use Pythagoras' theorem to calculate the length of the sloping strut.



- 8 Alicia paces out 100 m from the base of a church. She then measures the angle to the top of the spire as  $23^\circ$ . How high is the church spire?



- 9 A girl is flying a kite on a string 32 m long. The string, which is being held at 1 m above the ground, makes an angle of  $39^\circ$  with the horizontal. How high is the kite above the ground?

