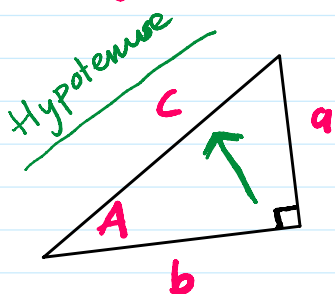


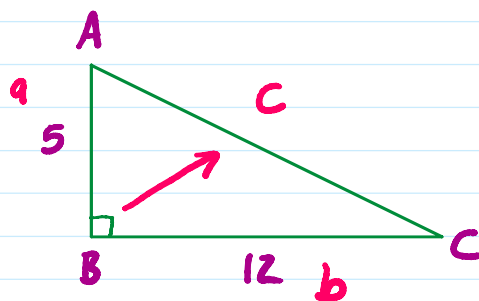
# Log Tables Pg 16

## Right angled triangle



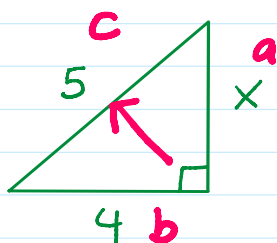
Side C = hypotenuse - Always opposite the 90° angle.

Eg 1) Find |AC|



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 c^2 &= 5^2 + 12^2 \\
 c^2 &= 25 + 144 \\
 c^2 &= 169 \\
 c &= \sqrt{169} \\
 c &= 13
 \end{aligned}$$

Eg 2) Find x



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 5^2 &= x^2 + 4^2 \\
 25 &= x^2 + 16 \\
 -16 \quad & \left| \quad 9 = x^2 \quad \right| \quad -16 \\
 \sqrt{9} &= x \\
 3 &= x
 \end{aligned}$$



T&Th 22.1  
Theorem o...



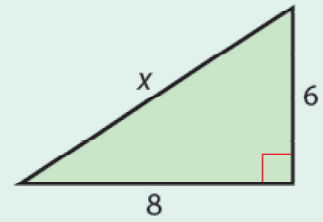
T&Th 22.1  
Theorem o...



## Section 22.1 The Theorem of Pythagoras

## Example 1

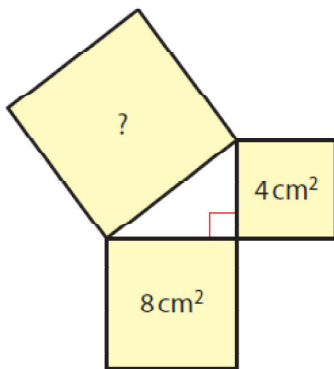
Find the length of the side marked  $x$  in the given right-angled triangle.



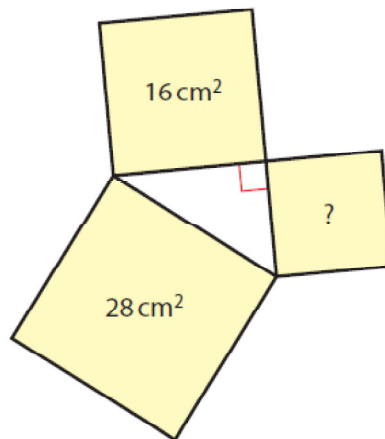
## Exercise 22.1

1. Find the missing areas of the squares on these right-angled triangles.

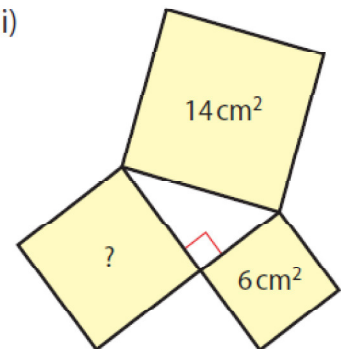
(i)



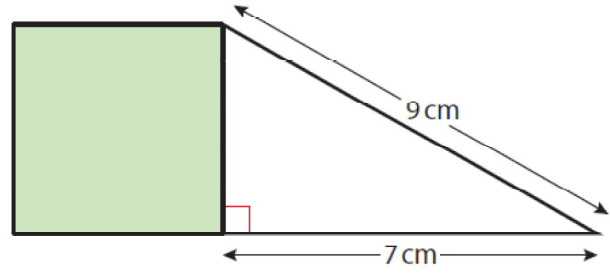
(ii)



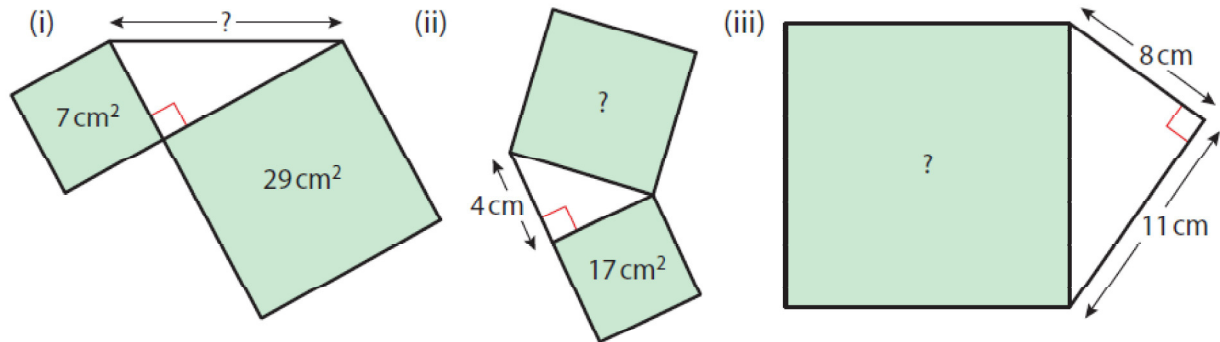
(iii)



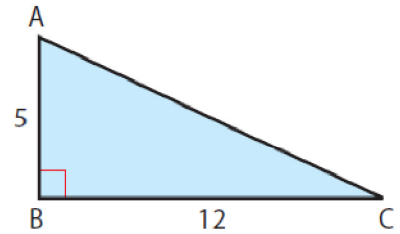
2. What is the area of the square drawn here?



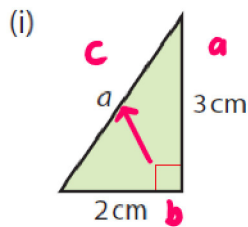
3. Work out the missing area or length in each of these.



4. Use Pythagoras' theorem to find the length of the side [AC].



5. Calculate the length of the side marked with a letter in each of the following triangles. You may leave your answer in  $\sqrt{\quad}$  form, where necessary.



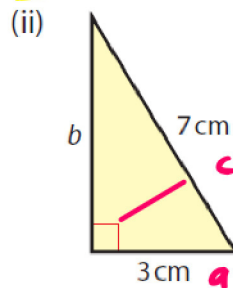
$$c^2 = a^2 + b^2$$

$$c^2 = 3^2 + 2^2$$

$$c^2 = 9 + 4$$

$$c^2 = 13$$

$$c = \sqrt{13}$$



$$7^2 = 3^2 + b^2$$

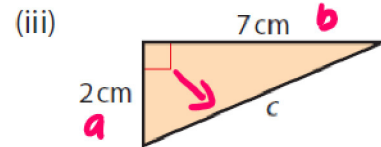
$$49 = 9 + b^2$$

$$-9 \quad | \quad 40 = b^2 \quad | \quad -9$$

$$\sqrt{40} = b$$

$$\sqrt{4 \times 10}$$

$$2\sqrt{10}$$



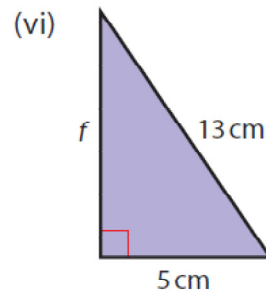
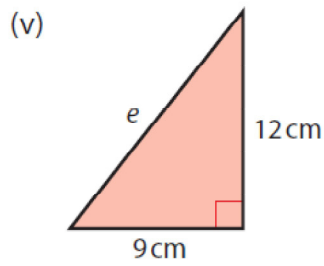
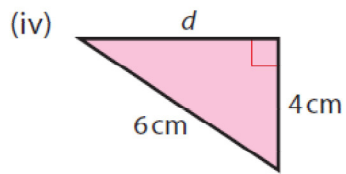
$$c^2 = 2^2 + 7^2$$

$$c^2 = 4 + 49$$

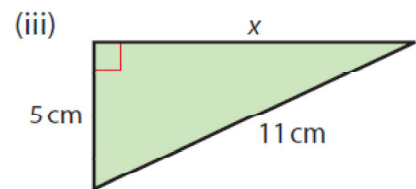
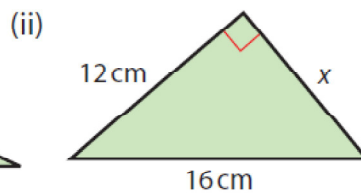
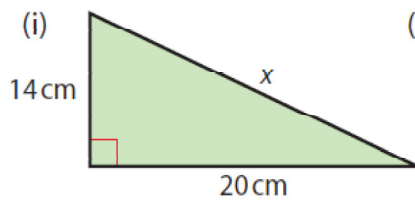
$$c^2 = 53$$

$$c = \sqrt{53}$$

5. Calculate the length of the side marked with a letter in each of the following triangles. You may leave your answer in  $\sqrt{\quad}$  form, where necessary.



6. Find the length of the side marked  $x$  in each of these triangles. Give each answer correct to 1 decimal place.



7. A rectangle is 10 cm long and 8 cm wide. Calculate the length of the diagonal. Give your answer in centimetres, correct to one decimal place.

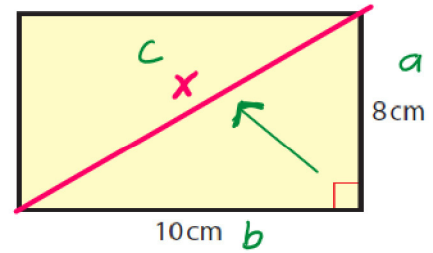
$$c^2 = a^2 + b^2$$

$$x^2 = 8^2 + 10^2$$

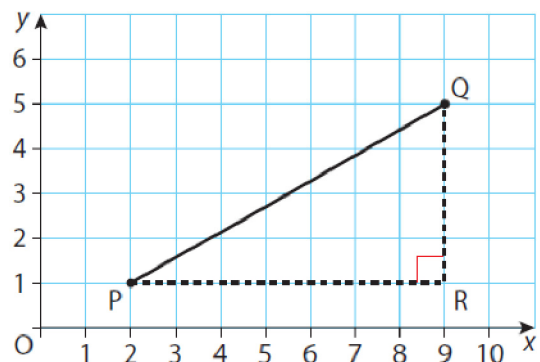
$$x^2 = 64 + 100$$

$$x^2 = 164$$

$$x = \sqrt{164} = 12.8 \text{ cm}$$

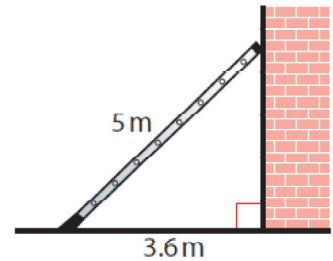


8. Use the given grid to write down the lengths of [PR] and [QR]. Hence find the length of [PQ], correct to one decimal place.

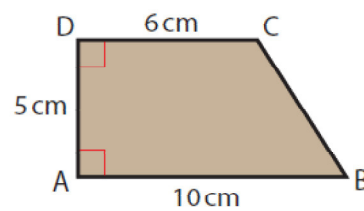


HW 9+10

9. The diagram shows a ladder leaning against a vertical wall. The foot of the ladder is on horizontal ground, 3.6 m from the wall. The length of the ladder is 5 m. Work out how far up the wall the ladder reaches. Give your answer in metres, correct to 1 decimal place.



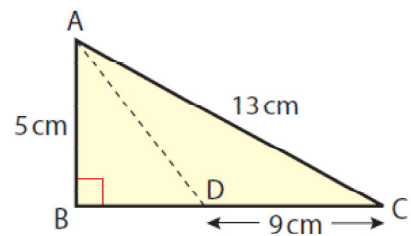
10. In the given figure,  $|AB| = 10$  cm,  $|AD| = 5$  cm and  $|DC| = 6$  cm. The angles at A and D are right angles. Find the length of  $[BC]$ , correct to one decimal place.



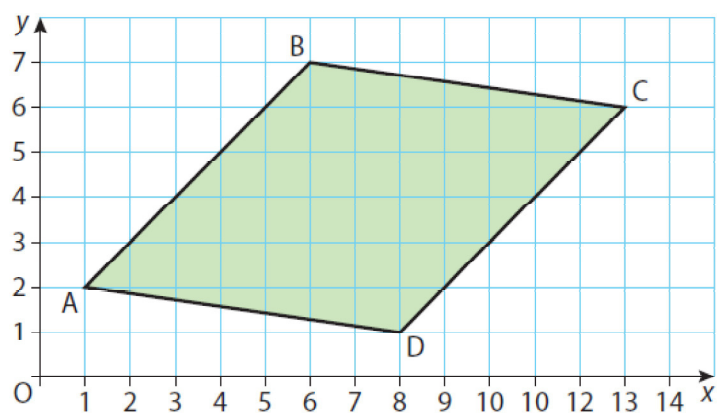


**11.** The diagram shows a right-angled triangle ABC.

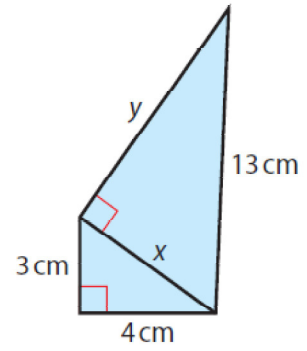
- (i) Find the length of [BD].
- (ii) Find the length [AD] in centimetres, correct to one decimal place.



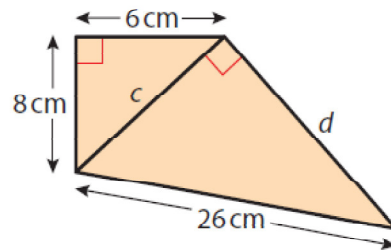
**12.** Use the grid and the Theorem of Pythagoras to work out the lengths of the sides of the given figure. Give your answer correct to one decimal place.



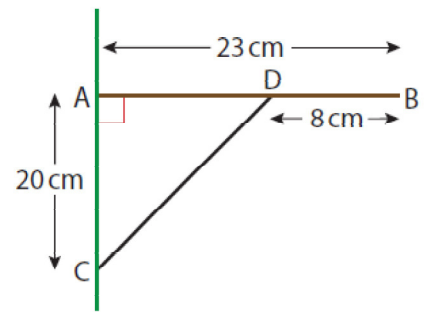
- 13.** Calculate the lengths of the sides marked  $x$  and  $y$  in the given right-angled triangles.



- 14.** In the given figure, the two right angles are marked. Find the lengths of  $c$  and  $d$ .



- 15.** The diagram shows a horizontal shelf [AB].  
The shelf is fixed to a vertical wall at A.  
The support [CD] is fixed to the wall at C and to the shelf at D.  
 $|AB| = 23 \text{ cm}$ ,  $|AC| = 20 \text{ cm}$  and  $|BD| = 8 \text{ cm}$ .  
Calculate the length of [CD].



- 16.** The area of a square drawn on the hypotenuse of a right-angled, isosceles triangle is  $24 \text{ cm}^2$ .  
Work out the area of the square drawn on each of the other two sides.

- 17.** The given television has a rectangular screen with a diagonal of length 74 cm. The sides of the screen are in the ratio 5 : 3. Work out the lengths of these sides, in centimetres, correct to 1 decimal place.



- 18.** Explain why a triangle of sides 12 cm, 13 cm and 18 cm is not right-angled.

# Answers

## Exercise 22.1

1. (i)  $12 \text{ cm}^2$       (ii)  $12 \text{ cm}^2$       (iii)  $8 \text{ cm}^2$
2.  $32 \text{ cm}^2$
3. (i)  $6 \text{ cm}$       (ii)  $33 \text{ cm}^2$       (iii)  $185 \text{ cm}^2$
4. 13
5. (i)  $\sqrt{13} \text{ cm}$       (ii)  $2\sqrt{10} \text{ cm}$       (iii)  $\sqrt{53} \text{ cm}$   
(iv)  $2\sqrt{5} \text{ cm}$       (v)  $15 \text{ cm}$       (vi)  $12 \text{ cm}$
6. (i)  $24.4 \text{ cm}$       (ii)  $10.6 \text{ cm}$       (iii)  $9.8 \text{ cm}$
7.  $12.8 \text{ cm}$       8. 7, 4; 8.1      9.  $3.5 \text{ m}$
10.  $6.4 \text{ cm}$
11. (i)  $3 \text{ cm}$       (ii)  $5.8 \text{ cm}$
12. All sides are 7.1 units
13.  $x = 5 \text{ cm}$ ,  $y = 12 \text{ cm}$
14.  $c = 10 \text{ cm}$ ,  $d = 24 \text{ cm}$
15.  $25 \text{ cm}$
16. each  $12 \text{ cm}^2$
17.  $63.5 \text{ cm}$ ,  $38.1 \text{ cm}$
18.  $18^2 \neq 12^2 + 13^2$