

Similar triangles

About 50 minutes Calculator allowed 42 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/gcse-similar-triangles/

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks] **A2** From chapter 10 [2 marks]
- A recipe for 4 people uses 300 g of rice and 60 g of cheese. Kim has 1.1 kg of rice and 375 g of cheese. What is the largest number of people she can make the recipe for?
- A speed-time graph is a straight line from 8 m/s to 22 m/s over 7 seconds. Find the distance travelled.

Answer

Answer

- A3** Last lesson [2 marks] **A4** Key Stage 3 [2 marks]
- Sam's eyes are 1.8 m above the ground. Sam stands 19 m from a tree on level ground. The angle of elevation of the top of the tree from Sam's eyes is 45° . How tall is the tree?
- Write 0.34 as a fraction in its simplest form.

Answer

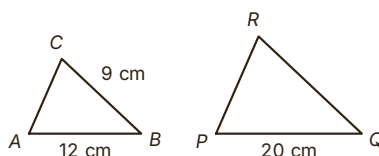
Answer

B Examples, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

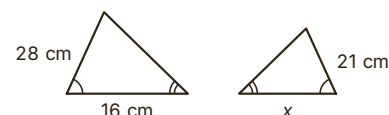
Triangles ABC and PQR are similar, with A , B and C matching P , Q and R . Work out QR .



Not drawn accurately

Hint Find the scale factor from a pair of matching sides that are both known.

- B1** The two triangles are similar. [3 marks]
 Matching angles are marked the same. Work out the length x .

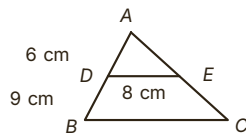


Not drawn accurately

Answer

EXAMPLE 2

D is on AB and E is on AC , with DE parallel to BC . Work out BC .

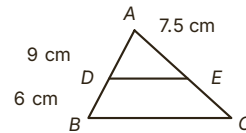


Not drawn accurately

Hint The triangles share angle A , and $DE \parallel BC$ makes the other angles equal. AD matches $AB = 15$ cm, not DB .

B2 [3 marks]

D is on AB and E is on AC , with DE parallel to BC . Work out the length of EC .

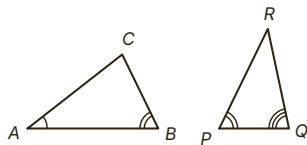


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Answer

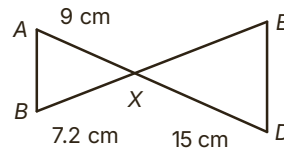
c Practice

- C1** In triangle ABC , angle $A = 38^\circ$ and angle $B = 64^\circ$. In triangle PQR , angle $P = 64^\circ$ and angle $Q = 78^\circ$. Show that the triangles are similar. [2 marks]



Not drawn accurately

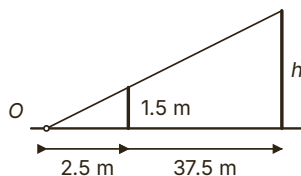
- C2** AB is parallel to DE . The straight lines AD and BE cross at X . Work out the length of BE . [3 marks]



Not drawn accurately

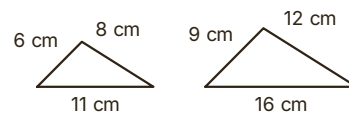
Answer

- C3** A post and a tower stand on level ground. From O , the tops of the post and the tower are in line. Work out the height h of the tower. [3 marks]



Not drawn accurately

- C4** Are these two triangles similar? Give a reason. [2 marks]



Not drawn accurately

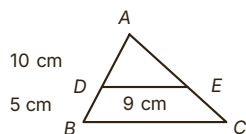
Answer

D Exam-style questions

- D1** D is on AB and E is on AC , with DE parallel to BC . Mia says, "The scale factor is $10 \div 5 = 2$, so $BC = 18$ cm."

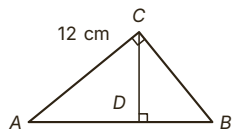
[3 marks]

Explain why Mia is wrong, and work out the correct length of BC .



Not drawn accurately

- D2** Triangle ABC has a right angle at C . $AB = 20$ cm and CD is perpendicular to AB .



Not drawn accurately

- (a) Show that triangles ACD and ABC are similar, then work out AD .

[4 marks]

Answer

- (b) Work out the perimeter of triangle BCD .

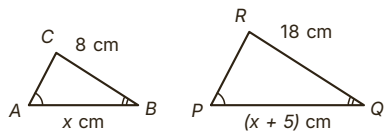
[3 marks]

Answer

Total for D2: 7 marks

- D3** Triangles ABC and PQR are similar. Work out x . You must show your working.

[4 marks]



Not drawn accurately

Answer

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 Triangle T has sides 4 cm, 6 cm and 9 cm. A triangle similar to T has one side of 18 cm. Work out every possible perimeter it could have. [4 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** The 18 cm side could match any side of T .
Hint 2 Perimeters scale by the same factor as sides.
Hint 3 Scale factors $\frac{18}{4}$, $\frac{18}{6}$ and $\frac{18}{9}$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

- | | | | |
|-------------------------------|-----------------------|-----------------------|-----------------------|
| I can find a scale factor. | ☐ | ☐ | ☐ |
| I can spot similar triangles. | ☐ | ☐ | ☐ |
| I can use algebra with them. | ☐ | ☐ | ☐ |