

Solving any triangle

About 50 minutes Calculator allowed 48 marks

Hints online, answers free with an account:
mathswariz.uk/worksheets/gcse-solving-any-triangle/

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** Last lesson [2 marks]
- Work out the exact value of $8 \tan^2 60^\circ - 3 \sin^2 45^\circ$.
- Given that $\sin 41^\circ = 0.656$, solve $\sin x = -0.656$ for $0^\circ \leq x \leq 360^\circ$.

Answer

Answer

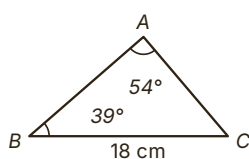
- A3** From chapter 6 [2 marks] **A4** From chapter 18 [2 marks]
- A map has a scale of 1 : 20000. A forest covers 17 cm^2 on the map. Work out the real area of the forest in km^2 .
- A frequency polygon for classes of width 10 joins the points (15, 2), (25, 3) and (35, 5). Work out an estimate of the mean.

Answer

Answer

B Example, then your turn

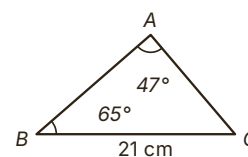
Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1Find AC . Give your answer to 1 d.p.

Not drawn accurately

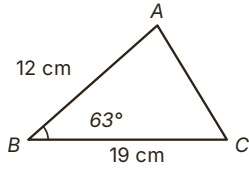
Hint AC is opposite the 39° angle and BC is opposite the 54° angle.

- B1** Find AC . Give your answer to 1 d.p. [3 marks]



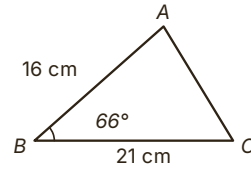
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Answer

EXAMPLE 2Find AC . Give your answer to 1 d.p.

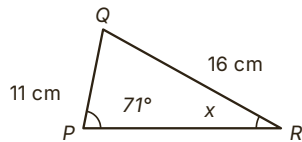
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Hint Two sides and the angle between them: use the cosine rule.

B2 Find AC . Give your answer to 1 d.p. [3 marks]

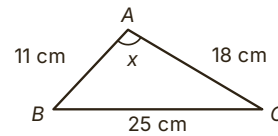
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Answer

c Practice**C1** Find the angle x , to 1 d.p. [3 marks]

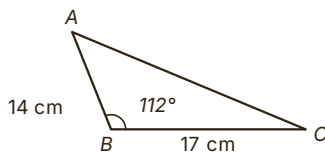
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Answer

C2 Find the angle x , to 1 d.p. [3 marks]

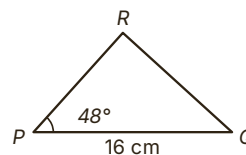
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Answer

C3 Find the area of triangle ABC , to 1 d.p. [2 marks]

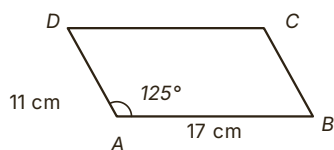
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Answer

C4 The area of triangle PQR is 84 cm^2 . Find PR , to 1 d.p. [3 marks]

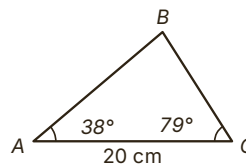
Not drawn accurately

Answer

C5 Find the area of the parallelogram $ABCD$, to 1 d.p. [2 marks]

Not drawn accurately

Answer

C6 Find the length of AB , to 1 d.p. [3 marks]

Not drawn accurately

Answer

D Exam-style questions

D1

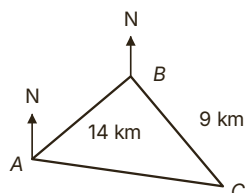
In triangle ABC , $AB = 26$ cm, $BC = 17$ cm and angle $BAC = 35^\circ$. Ella says, " $\sin C = \frac{26 \sin 35^\circ}{17}$, so angle $ACB = 61.3^\circ$. There is only one possible triangle."

[3 marks]

Explain why Ella is wrong. Give the other possible size of angle ACB to 1 d.p.

Answer

D2 A ship sails 14 km from A to B on a bearing of 050° , then 9 km to C on a bearing of 130° .



Not drawn accurately

(a) Show that angle $ABC = 100^\circ$. Then work out AC , to 1 d.p.

[3 marks]

Answer

(b) Work out the bearing of C from A , to 1 d.p.

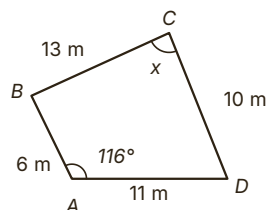
[3 marks]

Answer

Total for D2: 6 marks

D3 $ABCD$ is a quadrilateral field. Work out the size of angle BCD , to 1 d.p.

[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** In triangle ABC , $AB = 9$ cm, $BC = 14$ cm and the area is 50 cm^2 . Angle ABC is obtuse. Find the length of AC to 1 d.p. [5 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Use the area to find $\sin B$.
Hint 2 $\sin B = 100 \div 126$. B is obtuse, so it is not 52.5° .
Hint 3 $B = 127.5^\circ$. Now use the cosine rule for AC .

How did it go?

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

I can choose the sine rule or the cosine rule. ☐ ☐ ☐

I can find any side or angle of a triangle. ☐ ☐ ☐

I can use $\frac{1}{2}ab \sin C$ both ways. ☐ ☐ ☐