

1MA1 Higher themed papers: Trigonometry 2D and Bearings

Write your name here						
Surname	Other names					
Pearson Edexcel Level 1/Level 2 GCSE (9–1)	Centre Number <table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					
	Candidate Number <table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					
Mathematics Trigonometry 2D and Bearings						
	Paper Reference 1MA1					
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.						
Total Marks <table border="1"><tr><td></td></tr></table>						

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

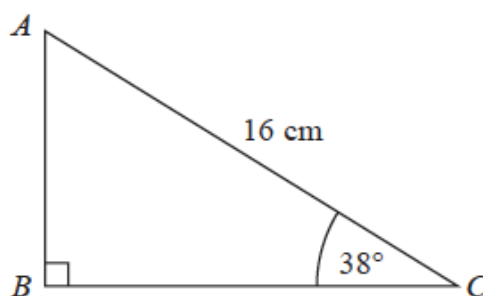
- The total mark for this paper is **88**. There are **23** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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- 1** ABC is a right-angled triangle.

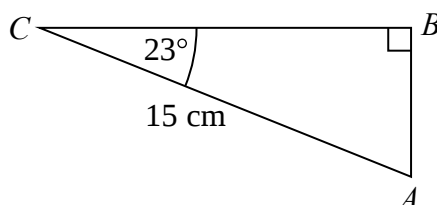


Calculate the length of AB .
Give your answer correct to 2 decimal places.

.....cm

(Total for Question 1 is 2 marks)

- 2** ABC is a right-angled triangle.



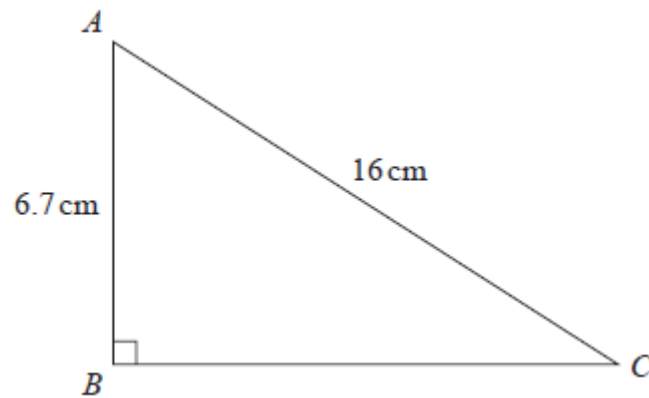
Calculate the length of AB .
Give your answer correct to 3 significant figures.

.....cm

(Total for Question 2 is 2 marks)

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- 3** ABC is a right-angled triangle.



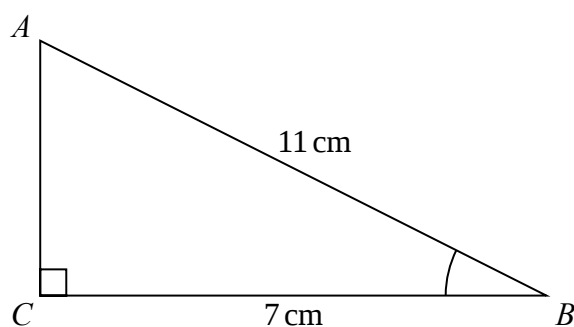
Calculate the length of BC .
Give your answer correct to 1 decimal place.

..... cm

(Total for Question 3 is 3 marks)

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- 4** ABC is a right-angled triangle.



- (a) Work out the size of angle ABC .
Give your answer correct to 1 decimal place.

.....[°]
(2)

The length of the side AB is reduced by 1 cm .

The length of the side BC is still 7 cm .

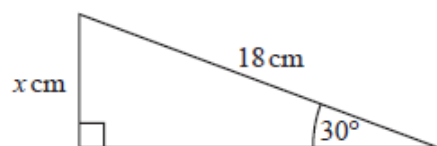
Angle ACB is still 90°

- (b) Will the value of $\cos ABC$ increase or decrease?
You must give a reason for your answer.

.....
.....
(1)

(Total for Question 4 is 3 marks)

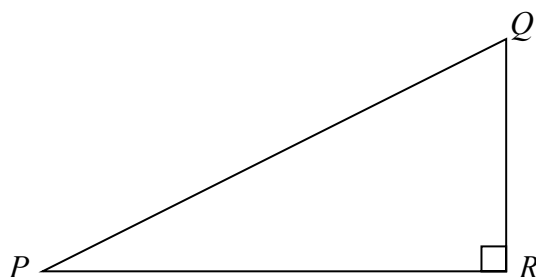
5



Work out the value of x .

.....
(Total for Question 5 is 2 marks)

6 Here is triangle PQR .



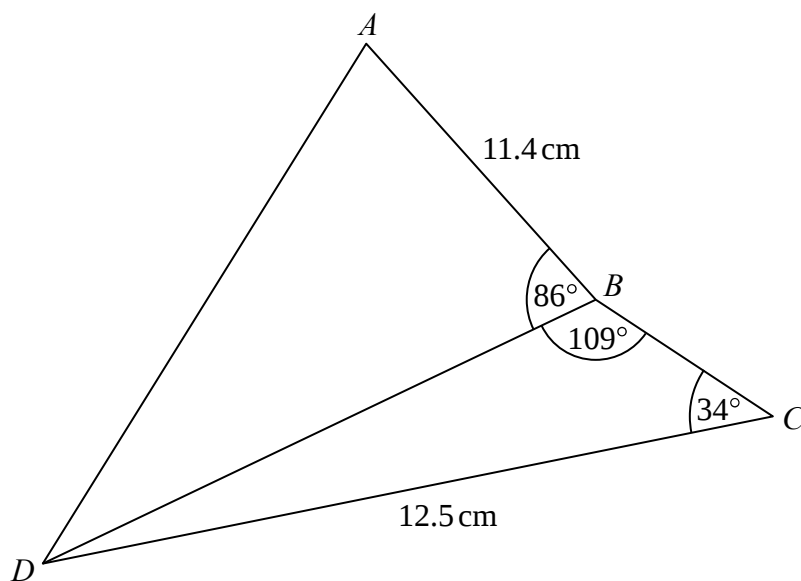
The length of QR is 60% of the length of PR .

Find the value of $\sin QPR$.

Give your answer correct to 3 significant figures.

.....
(Total for Question 6 is 3 marks)

7



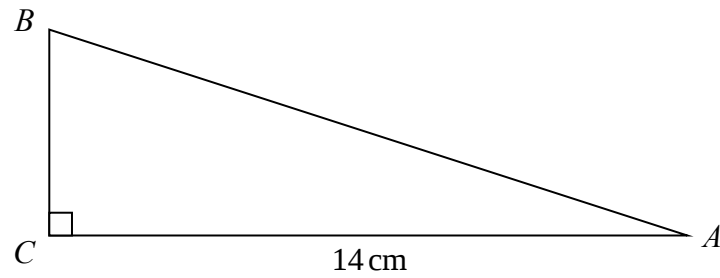
Work out the length of AD .
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 7 is 5 marks)

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- 8** ABC is a right-angled triangle.



$AC = 14\text{ cm}$.

Angle $C = 90^\circ$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB .

Give your answer correct to 3 significant figures.

.....cm

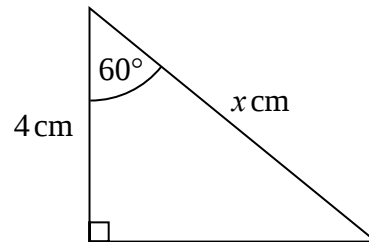
(Total for Question 8 is 4 marks)

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- 9** (a) Write down the exact value of $\tan 45^\circ$

.....
(1)

Here is a right-angled triangle.



$$\cos 60^\circ = 0.5$$

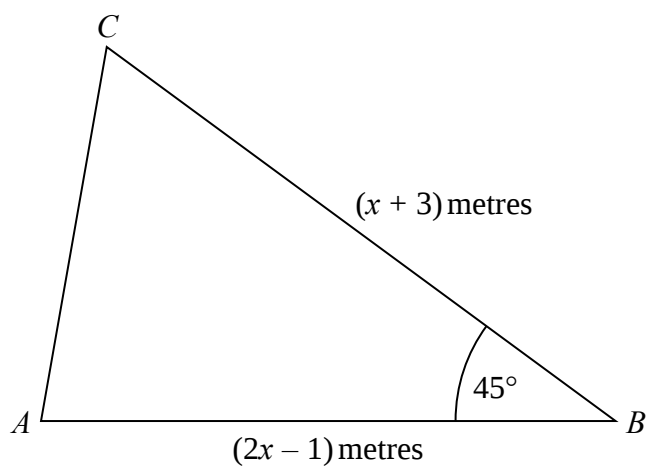
- (b) Work out the value of x .

.....
(2)

(Total for Question 9 is 3 marks)



10



The area of triangle ABC is $6\sqrt{2} \text{ m}^2$.

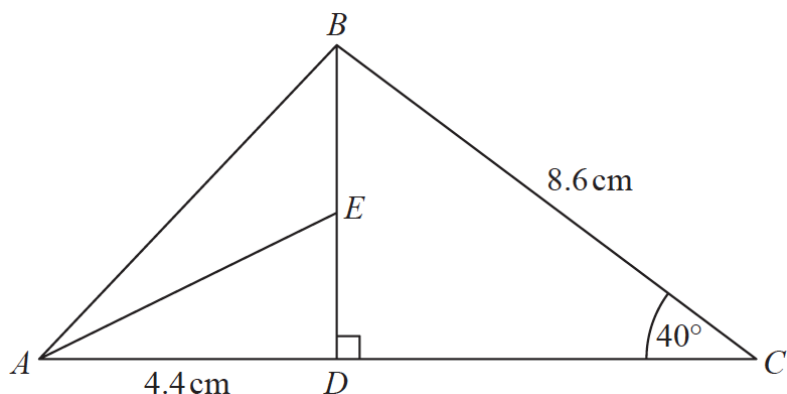
Calculate the value of x .

Give your answer correct to 3 significant figures.

.....
(Total for Question 10 is 5 marks)

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- 11** The diagram shows triangle ABC .



ADC and DEB are straight lines.

$AD = 4.4$ cm

$BC = 8.6$ cm

E is the midpoint of DB .

Angle $CDB = 90^\circ$

Angle $DCB = 40^\circ$

Work out the size of angle EAD .

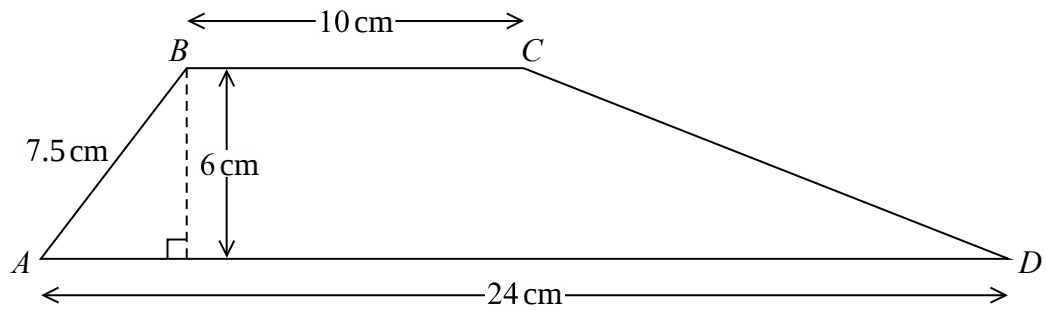
Give your answer correct to 1 decimal place.

You must show all your working.

.....^o
(Total for Question 11 is 4 marks)

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- 12** $ABCD$ is a trapezium.

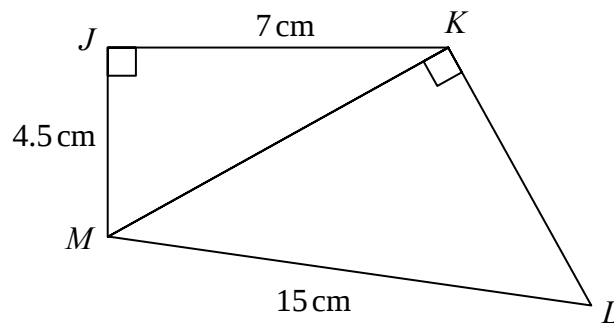


Work out the size of angle CDA .
Give your answer correct to 1 decimal place.

..... °
(Total for Question 12 is 5 marks)

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- 13** The diagram shows a quadrilateral $JKLM$.



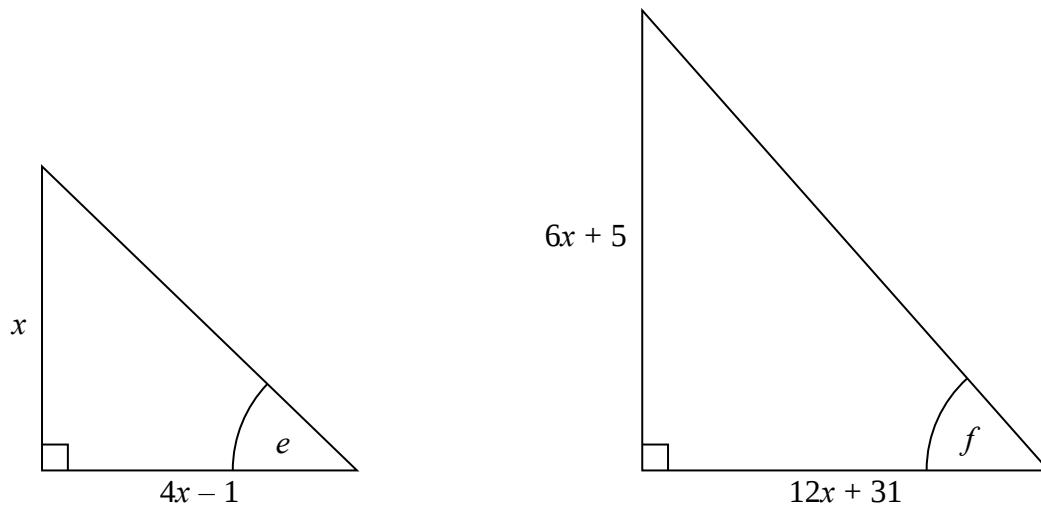
Work out the size of angle KLM .
Give your answer correct to 3 significant figures.

.....°

(Total for Question 13 is 4 marks)

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- 14** Here are two right-angled triangles.



Given that

$$\tan e = \tan f$$

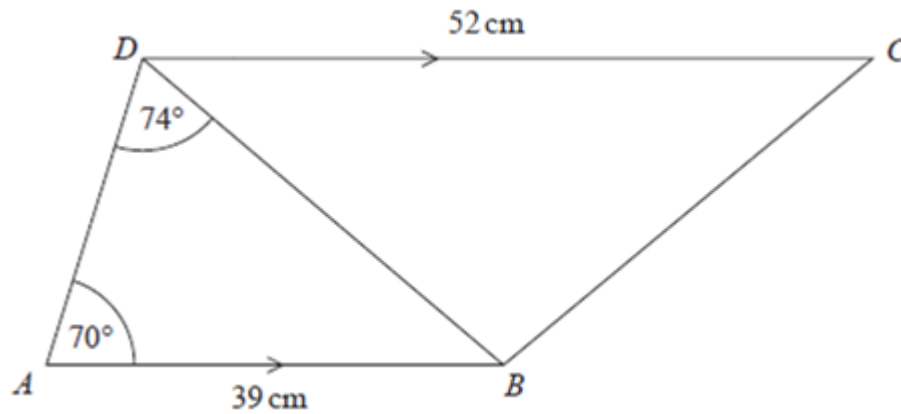
find the value of x .

You must show all your working.

.....
(Total for Question 14 is 5 marks)

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- 15 Here is trapezium $ABCD$.



AB and DC are parallel.

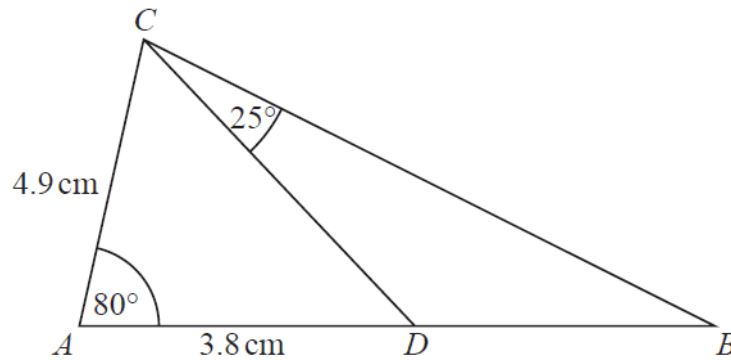
Work out the area of triangle BCD .

Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 15 is 5 marks)

16



ABC is a triangle.

D is a point on AB .

Work out the area of triangle BCD .

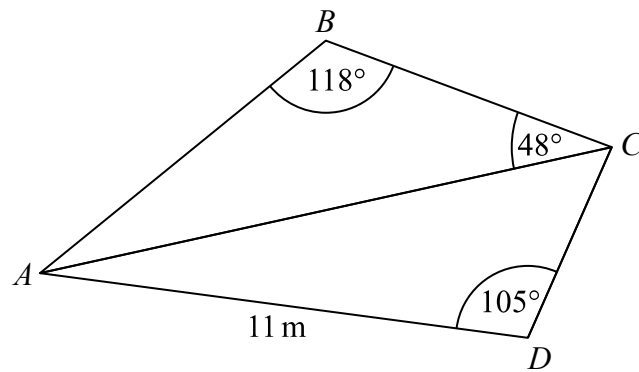
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 16 is 5 marks)

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- 17** ABC and ADC are triangles.



The area of triangle ADC is 56 m^2

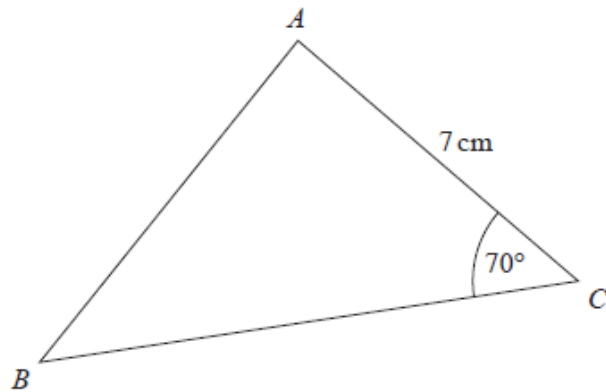
Work out the length of AB .

Give your answer correct to 1 decimal place.

..... m

(Total for Question 17 is 5 marks)

18



The area of triangle ABC is 42 cm^2

Find the length of AB .

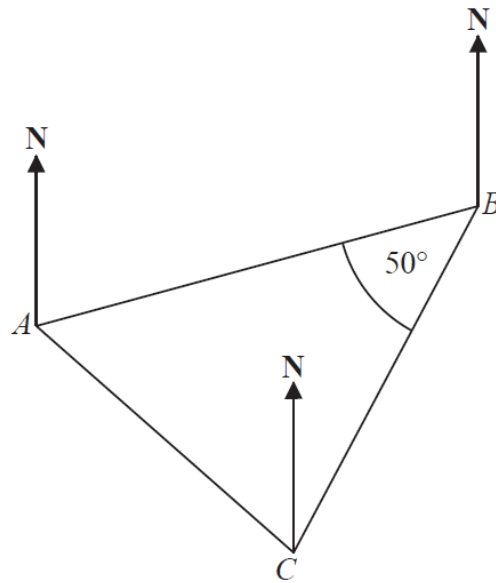
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 18 is 5 marks)

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- 19** The diagram shows the positions of three points, A , B and C , on a map.



The bearing of B from A is 070°

Angle ABC is 50°

$AB = CB$

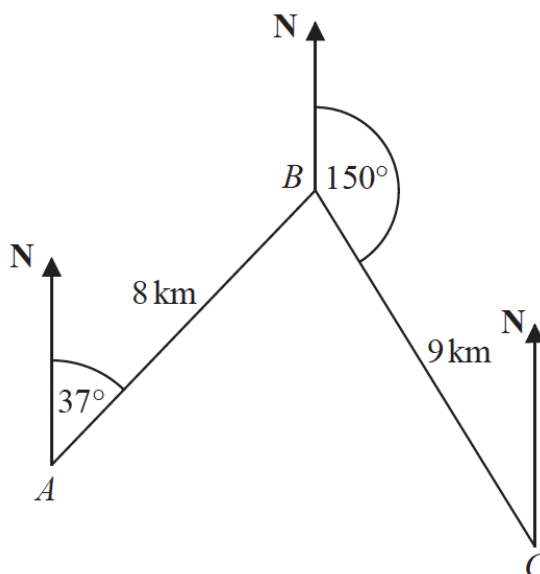
Work out the bearing of C from A .

..... $^\circ$

(Total for Question 19 is 3 marks)

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- 20** The diagram shows the positions of three towns, Acton (A), Barston (B) and Chorlton (C).



Barston is 8 km from Acton on a bearing of 037°
Chorlton is 9 km from Barston on a bearing of 150°

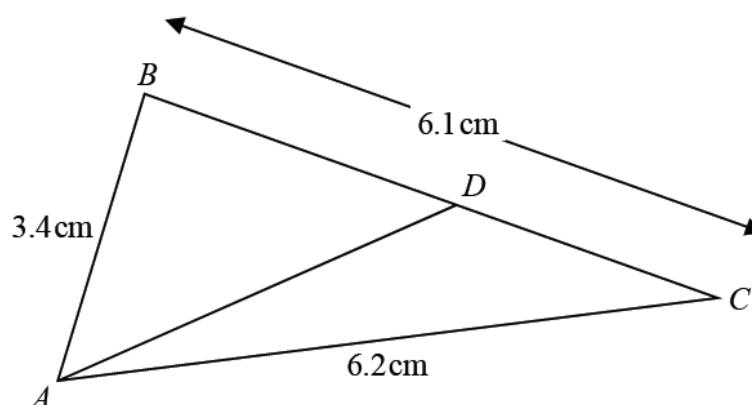
Find the bearing of Chorlton from Acton.
Give your answer correct to 1 decimal place.
You must show all your working.

..... $^\circ$

(Total for Question 20 is 5 marks)

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- 21** The diagram shows triangle ABC .



$$AB = 3.4\text{ cm} \quad AC = 6.2\text{ cm} \quad BC = 6.1\text{ cm}$$

D is the point on BC such that

$$\text{size of angle } DAC = \frac{2}{5} \times \text{size of angle } BCA$$

Calculate the length DC .

Give your answer correct to 3 significant figures.

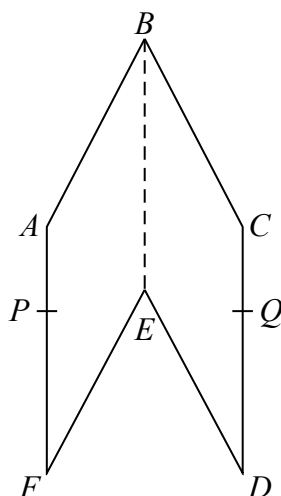
You must show all your working.

.....cm

(Total for Question 21 is 5 marks)



- 22 The diagram shows a hexagon $ABCDEF$.



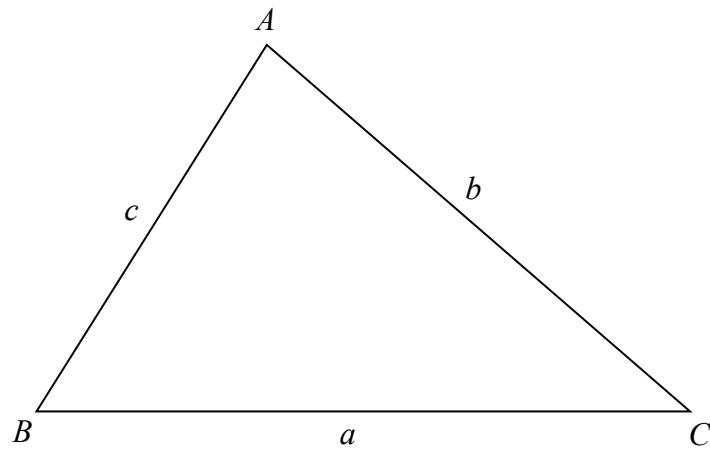
$ABEF$ and $CBED$ are congruent parallelograms where $AB = BC = x$ cm.
 P is the point on AF and Q is the point on CD such that $BP = BQ = 10$ cm.
 Given that angle $ABC = 30^\circ$,

prove that $\cos PBQ = 1 - \frac{(2 - \sqrt{3})}{200} x^2$

(Total for Question 22 is 5 marks)

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- 23 The diagram shows an acute-angled triangle ABC .



Prove that area of triangle $ABC = \frac{1}{2}ab \sin C$

(Total for Question 23 is 3 marks)

TOTAL MARKS FOR PAPER: 88