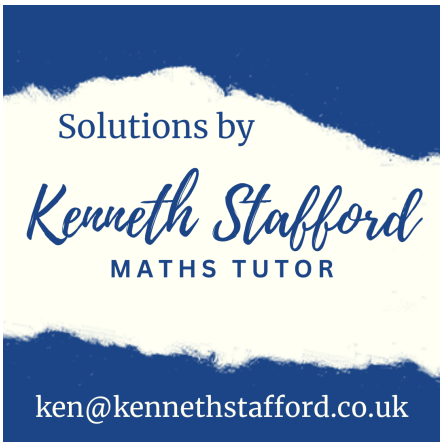
Name: SOLUTIONS

GCSE (1 - 9)

The Sine Rule



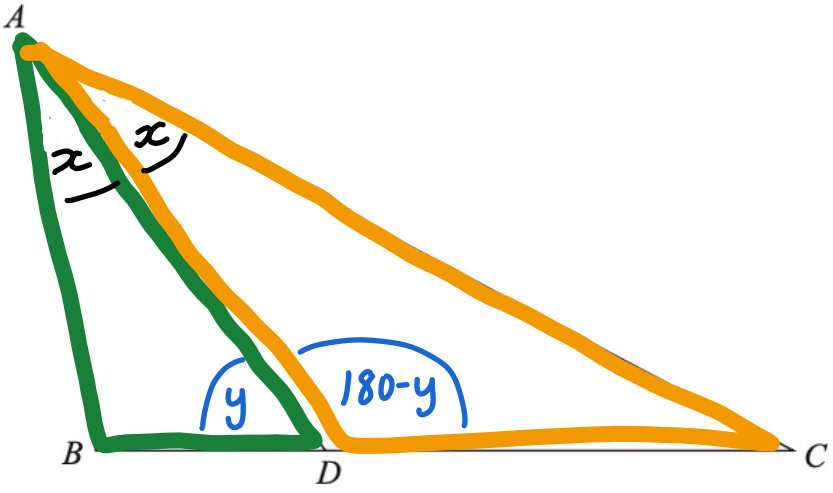


These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***November 2021*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk
These worksheets were made using examq.co.uk

Question	Where the question appeared
1	Edexcel, GCSE, Autumn 2021, Paper 3H, Q23
2	Edexcel, GCSE, Autumn 2020, Paper 2H, Q13
3	Edexcel, GCSE, Autumn 2019, Paper 3H, Q18
4	Edexcel, GCSE, Summer 2019, Paper 3H, Q23
5	Edexcel, GCSE, Autumn 2018, Paper 3H, Q16
6	Edexcel, GCSE, Summer 2018, Paper 3H, Q17
7	Edexcel, GCSE, Autumn 2017, Paper 3H, Q17

1

ABC is a triangle.



D is the point on BC such that angle BAD = angle $DAC = x°$

Prove that $\frac{AB}{BD} = \frac{AC}{DC}$

$\frac{BD}{\sin x} = \frac{AB}{\sin y}$

$\frac{DC}{\sin x} = \frac{AC}{\sin(180-y)}$

$\frac{\sin y}{\sin x} = \frac{AB}{BD}$

$\frac{\sin(180-y)}{\sin x} = \frac{AC}{DC}$

$\sin(180-y) = \sin y$

So $\frac{\sin y}{\sin x} = \frac{AC}{DC}$

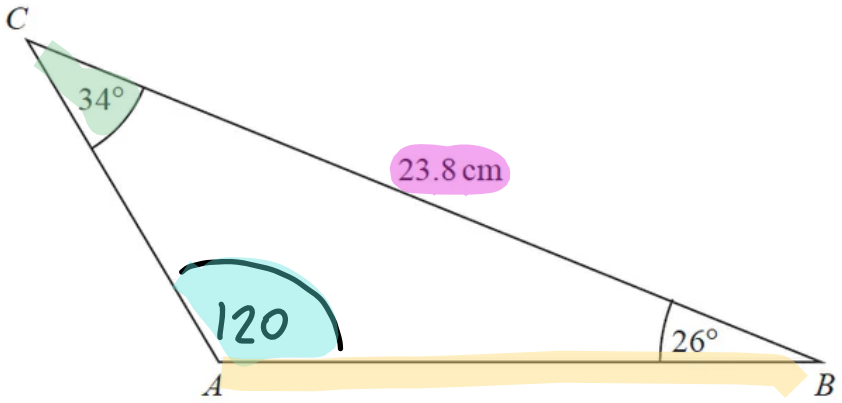
So $\frac{AC}{DC} = \frac{AB}{BD}$

(Total for Question 23 is 4 marks)

[Edexcel, GCSE, Autumn 2021, Paper 3H, Q23]

2

Here is triangle ABC.



Work out the length of AB.
Give your answer correct to 1 decimal place.

$$\frac{AB}{\sin(34)} = \frac{23.8}{\sin(120)}$$

$$AB = \sin(34) \times \frac{23.8}{\sin(120)}$$

$$AB = 15.367$$

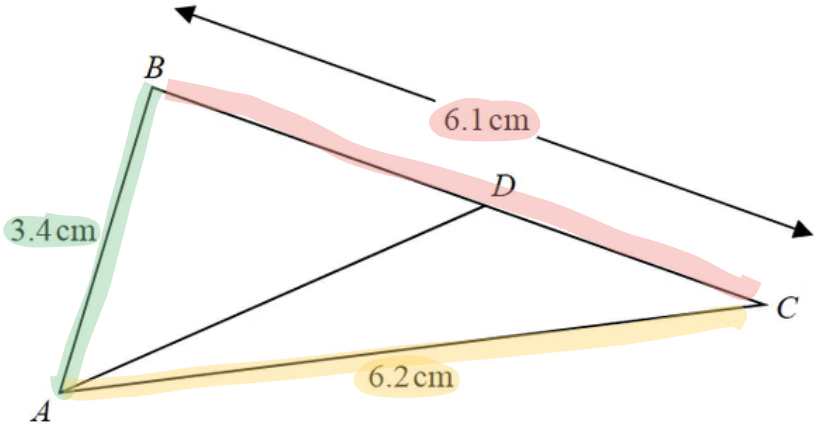
15.4 ..... cm

(Total for Question 13 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 2H, Q13]

3

The diagram shows triangle ABC.

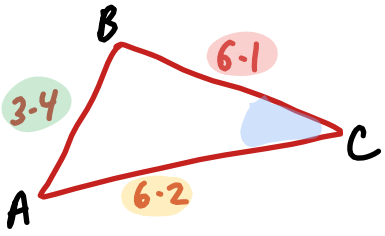


$AB = 3.4$ cm $\quad AC = 6.2$ cm $\quad BC = 6.1$ cm

D is the point on BC such that

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

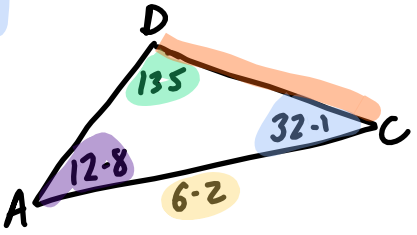
Calculate the length DC.
Give your answer correct to 3 significant figures.
You must show all your working.



$$\cos(BCA) = \frac{6.1^2 + 6.2^2 - 3.4^2}{2 \times 6.1 \times 6.2}$$

$$BCA = 32.0804^\circ$$

$$DAC = 32.0804 \times \frac{2}{5} = 12.832^\circ$$



$$\frac{DC}{\sin(12.832)} = \frac{6.2}{\sin(135)}$$

$$DC = \frac{6.2}{\sin(135)} \times \sin(12.8) = 1.95$$

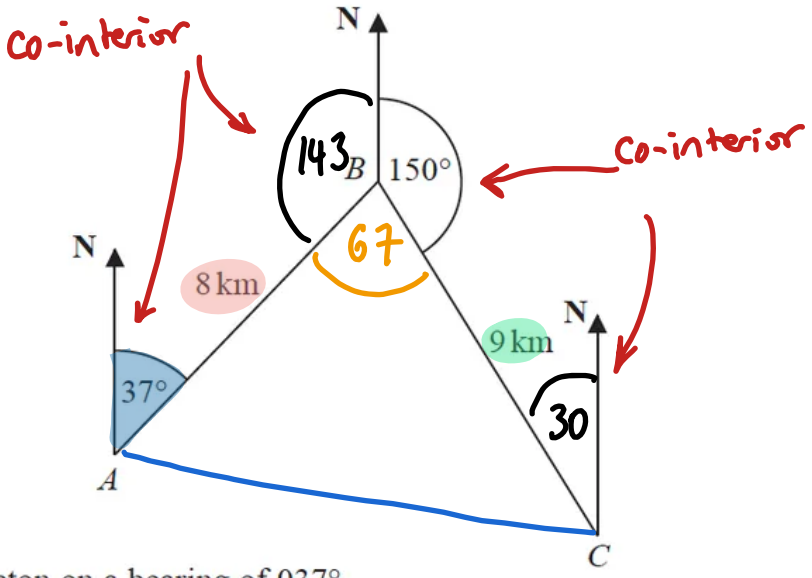
..... cm

(Total for Question 18 is 5 marks)

[Edexcel, GCSE, Autumn 2019, Paper 3H, Q18]

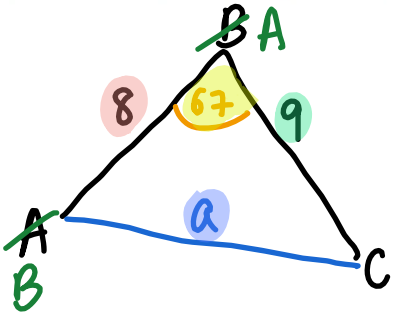
4

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.



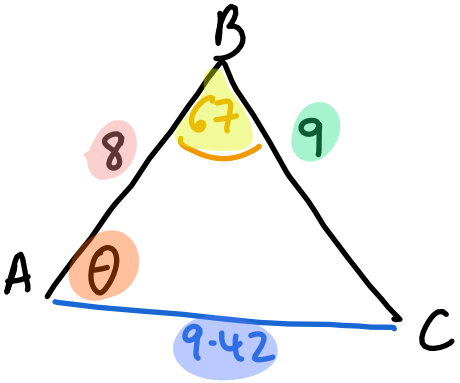
$a^2 = b^2 + c^2 - 2bc \cos A$

$a^2 = 9^2 + 8^2 - 2 \times 9 \times 8 \times \cos 67$

$a^2 = 88.7347$

$a = \sqrt{88.7347}$

$a = 9.42$



$\frac{\sin\theta}{9} = \frac{\sin 67}{9.42}$

$\sin\theta = \frac{9\sin 67}{9.42}$

$\theta = \sin^{-1}\left(\frac{9\sin 67}{9.42}\right)$

$\theta = 61.58$

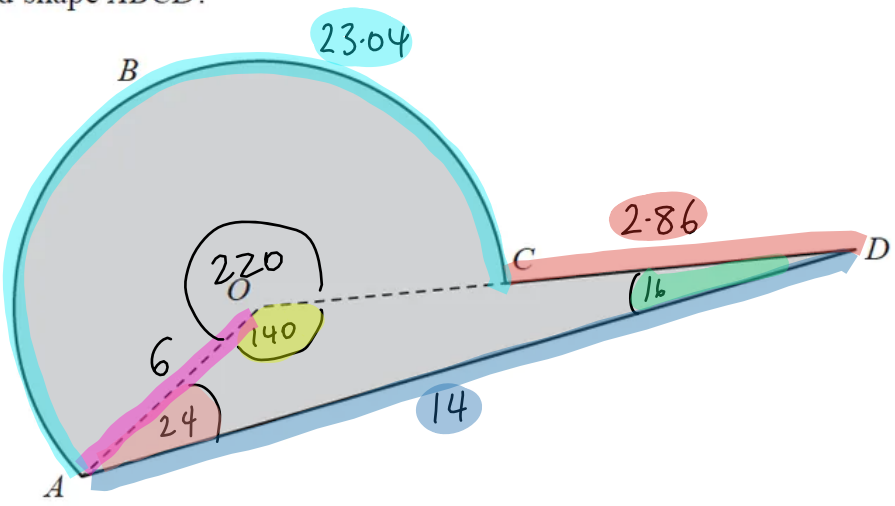
$37 + 61.58 = 098.6°$

(Total for Question 23 is 5 marks)

[Edexcel, GCSE, Summer 2019, Paper 3H, Q23]

5

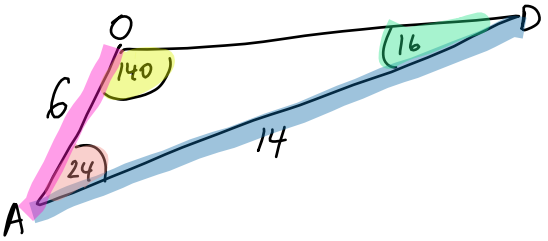
Here is a shaded shape $ABCD$.



The shape is made from a triangle and a sector of a circle, centre O and radius 6 cm.
OCD is a straight line.

$AD = 14$ cm
Angle $AOD = 140°$
Angle $OAD = 24°$

Calculate the perimeter of the shape.
Give your answer correct to 3 significant figures.



$OD^2 = 6^2 + 14^2 - 2 \times 6 \times 14 \times \cos(24)$

$OD^2 = 78.52$

$OD = \sqrt{78.52} = 8.86\text{cm}$

$CD = 8.86 - 6 = 2.86\text{ cm}$

$\text{Arc } ABC = \frac{220}{360} \times 12\pi = 23.04\text{cm}$

$\text{Perimeter} = 23.04 + 2.86 + 14$

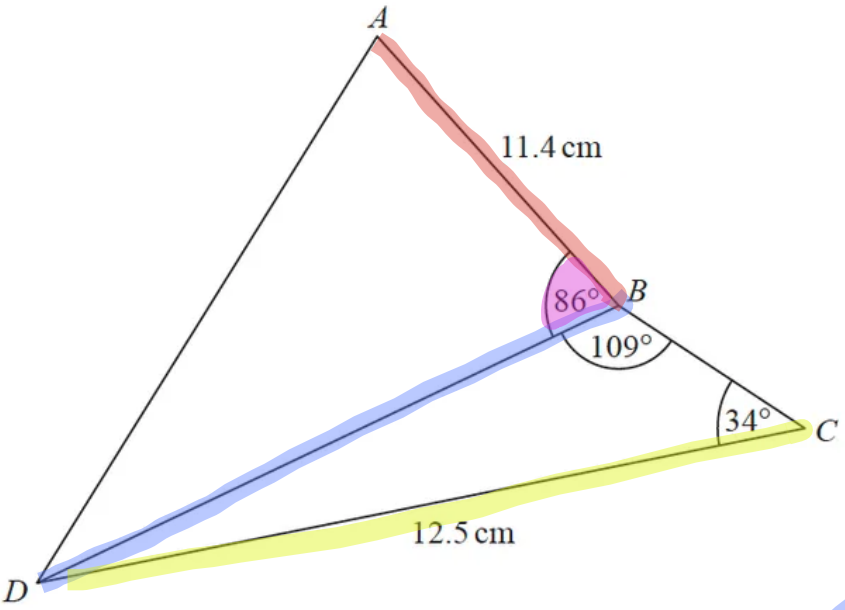
$= 39.898$

39.9 cm

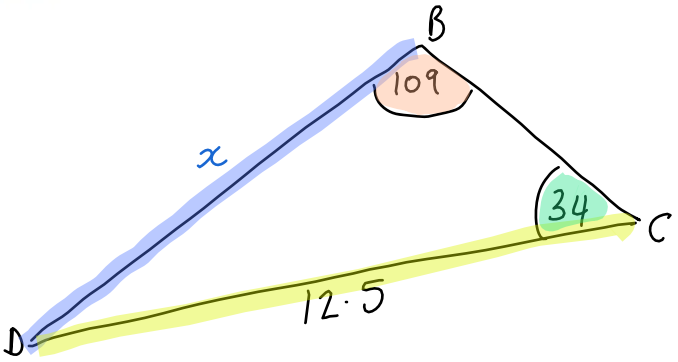
(Total for Question 16 is 5 marks)

[Edexcel, GCSE, Autumn 2018, Paper 3H, Q16]

6



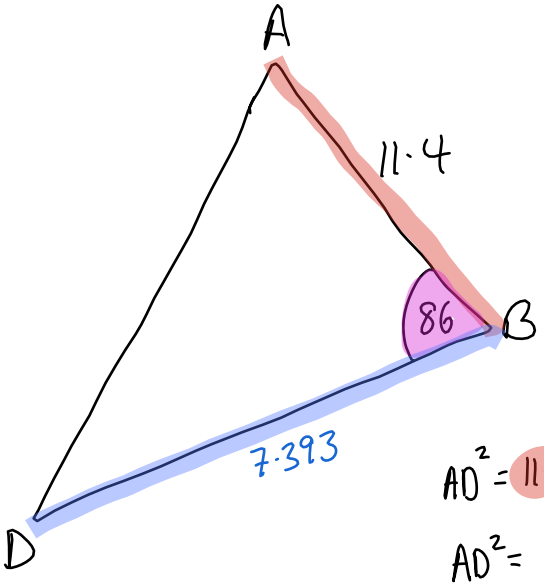
Work out the length of AD.
Give your answer correct to 3 significant figures.



$$\frac{x}{\sin(34)} = \frac{12.5}{\sin(109)}$$

$$x = \frac{12.5\sin(34)}{\sin(109)}$$

$$x = 7.393$$



$$AD^2 = 11.4^2 + (7.393)^2 - 2 \times 11.4 \times 7.393 \times \cos(86)$$

$$AD^2 = 172.85$$

$$AD = \sqrt{172.85} = 13.147$$

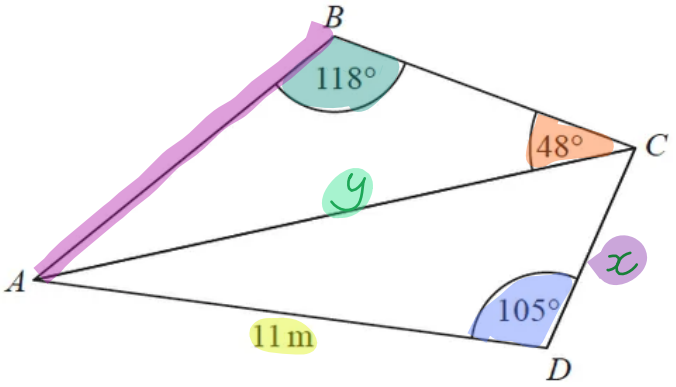
13·1 cm

(Total for Question 17 is 5 marks)

[Edexcel, GCSE, Summer 2018, Paper 3H, Q17]

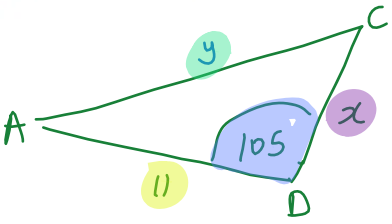
7

ABC and *ADC* are triangles.



The area of triangle *ADC* is 56 m²

Work out the length of *AB*.
Give your answer correct to 1 decimal place.



$\frac{1}{2} \times 11 \times x \times \sin(105) = 56$

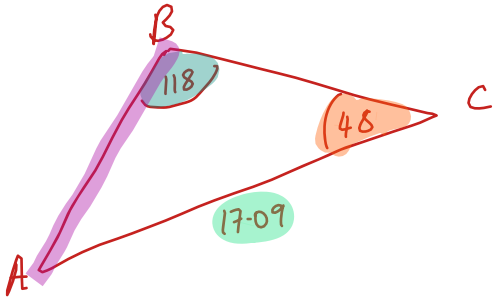
$x \times 11\sin(105) = 112$

$x = \frac{112}{11\sin(105)} = 10.54$

$y^2 = 11^2 + 10.54^2 - 2 \times 11 \times 10.54 \cos(105)$

$y^2 = 292.106$

$y = 17.09$



$\frac{AB}{\sin(48)} = \frac{17.09}{\sin(118)}$

$AB = \frac{17.09\sin(48)}{\sin(118)} = 14.38$

14.4 ..... m

(Total for Question 17 is 5 marks)

[Edexcel, GCSE, Autumn 2017, Paper 3H, Q17]