Name ANSWERS	Class

MATHS TEACHER HUB

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Angles in parallel lines

(9 – 1) Topic booklet

Higher

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

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.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1H** question you are not allowed to use a calculator.
- If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

Information

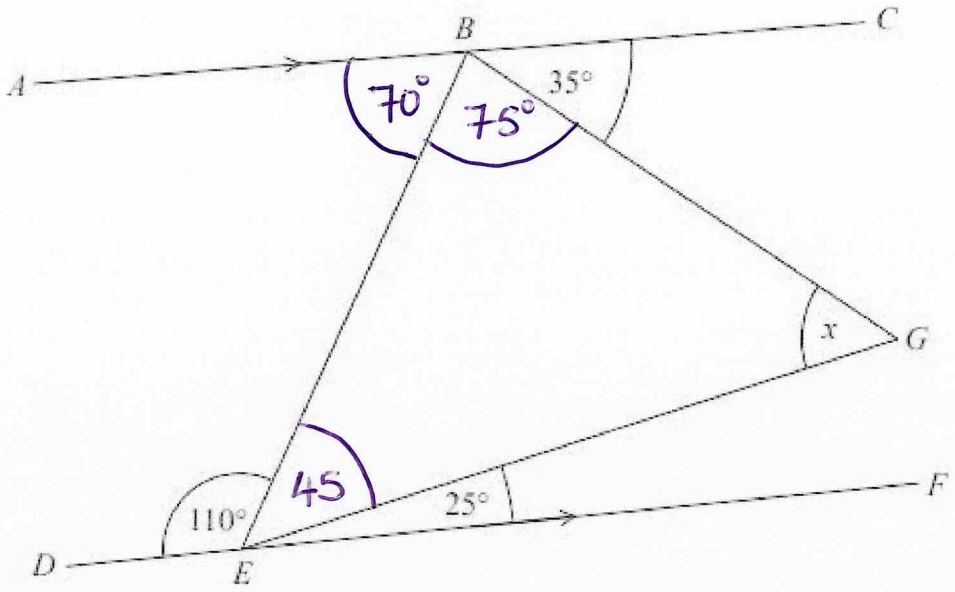
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

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.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

3 *BEG* is a triangle.



ABC and *DEF* are parallel lines.

Work out the size of angle *x*.
Give a reason for each stage of your working.

BEG = 45° because angles in a triangle add up to 180°

ABE = 70° because supplementary angles or co-interior angles add up to 180°

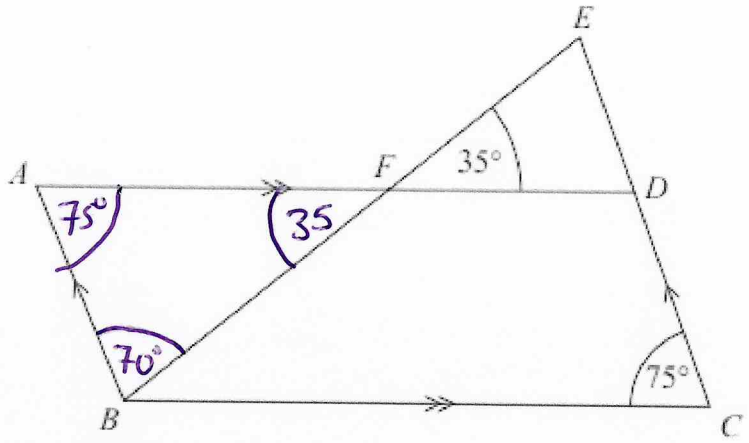
EBG = 75° because angles on a straight line add up to 180°

$x = 60°$ because angles in a triangle add to 180°

60 °

(Total for Question 3 is 4 marks)

3



ABCD is a parallelogram.
EDC is a straight line.
F is the point on *AD* so that *BFE* is a straight line.

Angle *EFD* = 35°
Angle *DCB* = 75°

Show that angle *ABF* = 70°
Give a reason for each stage of your working.

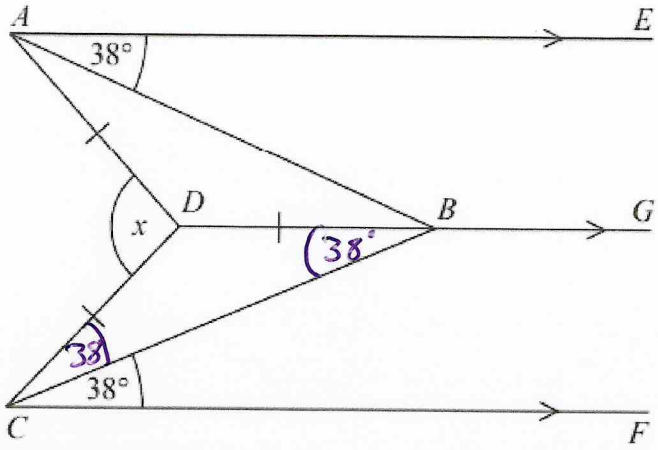
AFB = 35° because vertically opposite angles are equal.

FAB = 75° because opposite angles of a parallelogram are equal.

ABF = 70° because angles in a triangle add up to 180°

(Total for Question 3 is 4 marks)

3



AE, *DBG* and *CF* are parallel.
DA = *DB* = *DC*.
Angle *EAB* = angle *BCF* = 38°

Work out the size of the angle marked *x*.
You must show your working.

CBD = 38° because alternate angles are equal

BCD = 38° because base angles of an isosceles triangle are equal.

CDB = 104° Angles in a triangle add to 180°

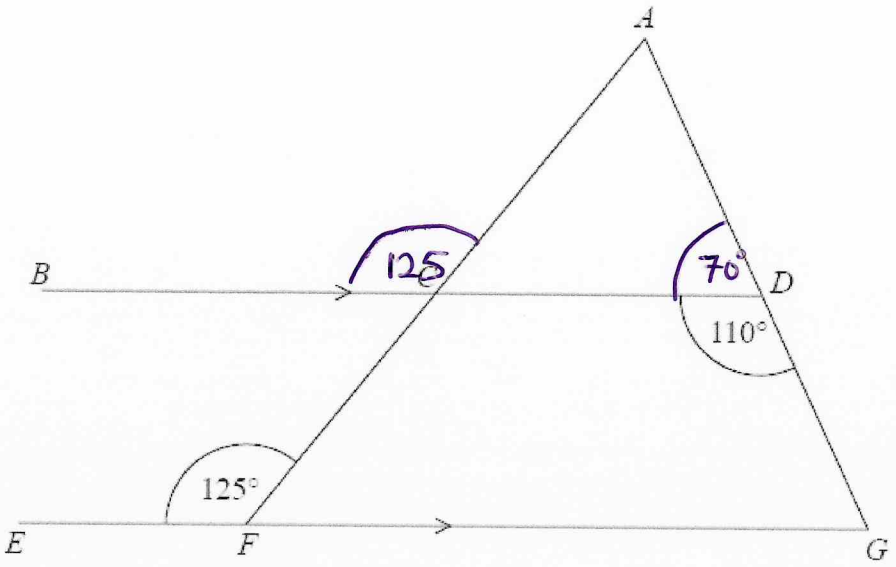
BDA = CDB

$x = 152°$ because angles around a point add up to 360°

152 °

(Total for Question 3 is 3 marks)

3 ACF and ADG are straight lines.
BCD and EFG are parallel lines.



Show that triangle ACD is isosceles.
Give a reason for each stage of your working.

ADC = 70° because angles on a straight line add up to 180°

BCA = 125° because corresponding angles are equal.

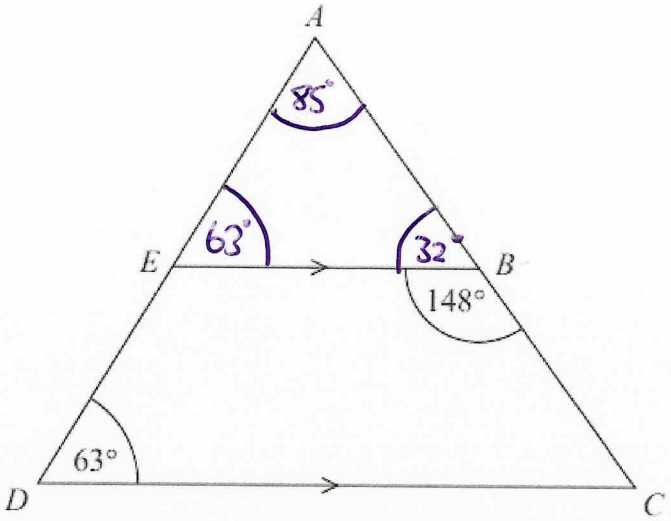
ACD = 55° because angles on a straight line add up to 180°

CAD = 55° because angles in a triangle add up to 180°

Triangle ACD has two identicle angles, therefore it is an isosceles triangle.

(Total for Question 3 is 5 marks)

6 ADC is a triangle.



AED and ABC are straight lines.
EB is parallel to DC.

Angle $EBC = 148°$
Angle $ADC = 63°$

Work out the size of angle EAB.
You must give a reason for each stage of your working.

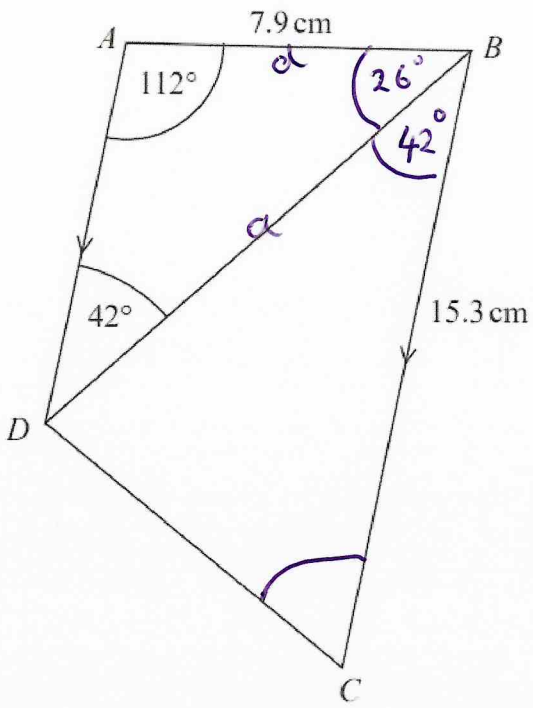
AEB = 63° because corresponding angles are equal

ABE = 32° because angles on a straight line add up to 180°

EAB = 85° because angles in a triangle add to 180°

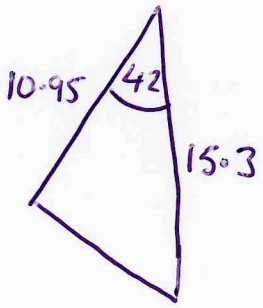
(Total for Question 6 is 5 marks)

16 *ABCD* is a trapezium.



AD is parallel to *BC*.

Calculate the area of triangle *BCD*.
Give your answer correct to 1 decimal place.



$$\frac{a}{\sin 112} = \frac{7.9}{\sin 42}$$

$$a = \sin 112 \times \frac{7.9}{\sin 42}$$

$$a = 10.95\text{cm}$$

$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2} \times 10.95 \times 15.3 \times \sin 42$$

$$= 56.05139807$$

56.1 ..... cm^2

(Total for Question 16 is 4 marks)