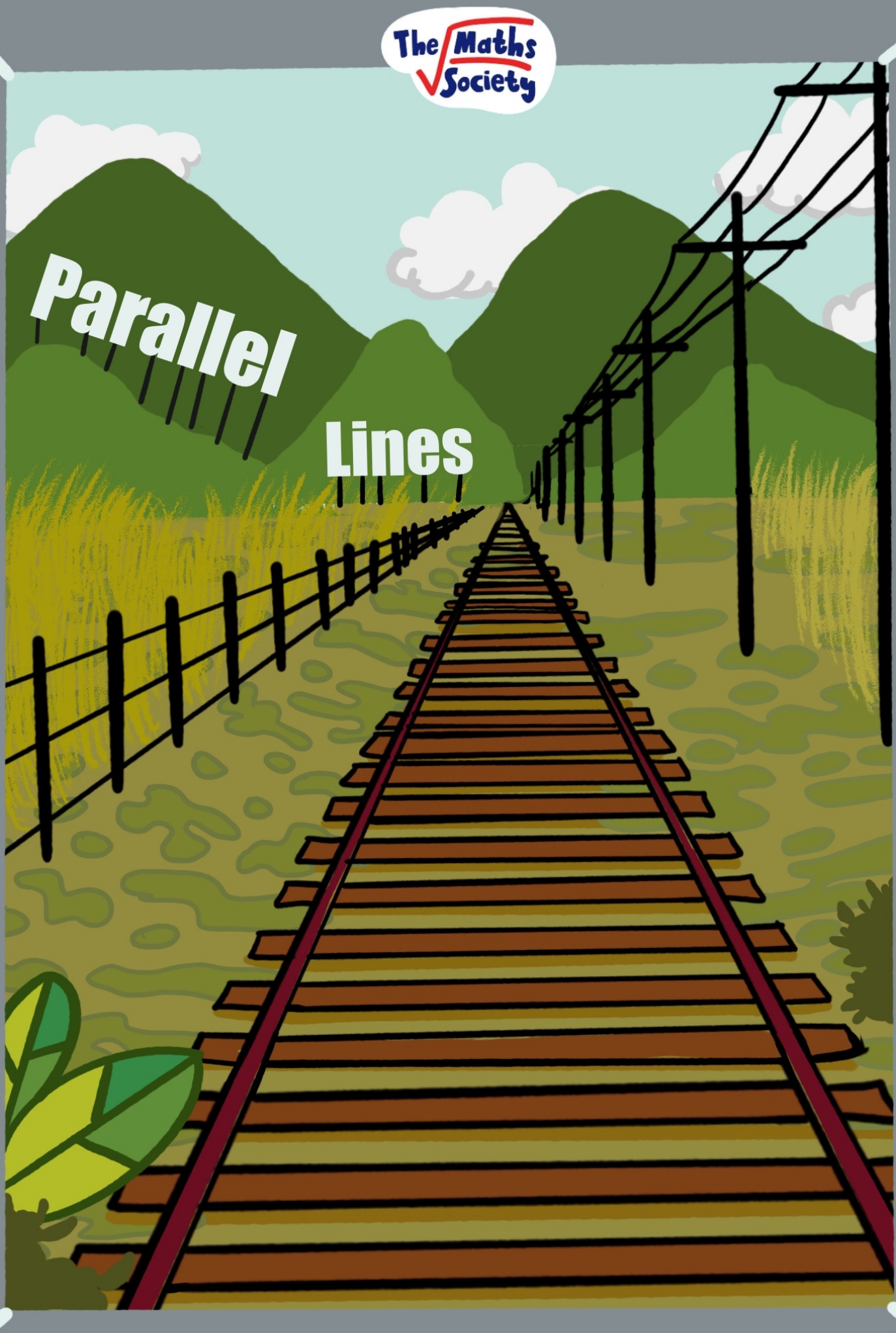

The Maths Society
Parallel
Lines

1.

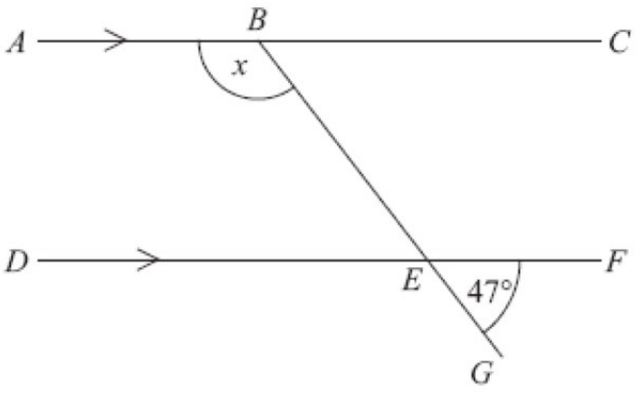


Diagram **NOT** accurately drawn

ABC and *DEF* are parallel lines.
BEG is a straight line.
Angle *GEF* = 47°.

Work out the size of the angle marked *x*.

Give reasons for your answer.

Method 1.

AC // DF

$x = \angle BEF$

$\angle BEF = 180 - 47 = 133$

Method 2.

$\angle DEB = 47$

AC // DF

$x + \angle DEB = 180$

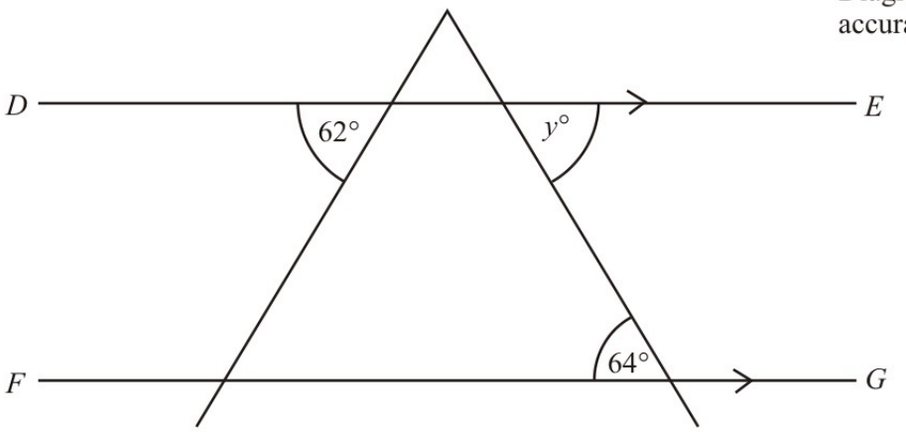
$x = 180 - 47 = 133$

133 .....°

(3 marks)

2.

Diagram **NOT** accurately drawn



DE is parallel to *FG*.

(i) Find the size of the angle marked $y°$.

64 °

(1)

(ii) **Give a reason for your answer.**

The alternating angle are the same

(2)

(3 marks)

3.

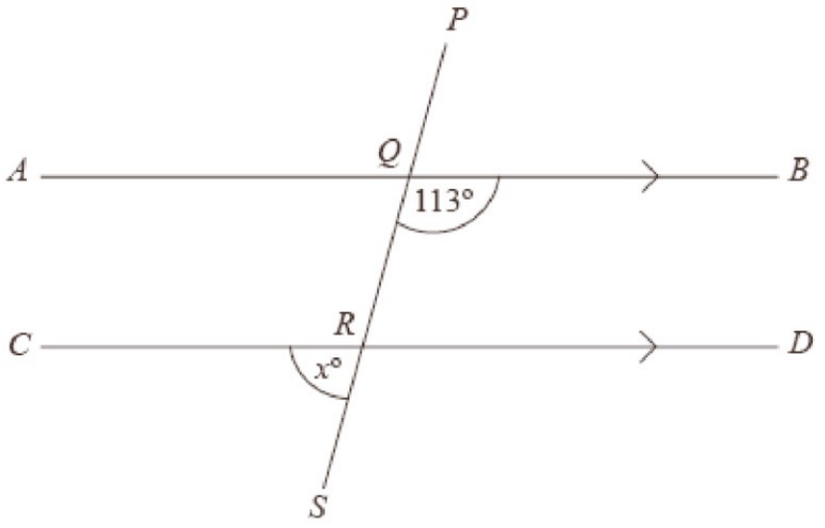


Diagram **NOT** accurately drawn

AQB, *CRD* and *PQRS* are straight lines.

AB is parallel to *CD*.

Angle *BQR* = 113º.

(a) Work out the value of *x*.

x = 67

(b) Give reasons for your answer.

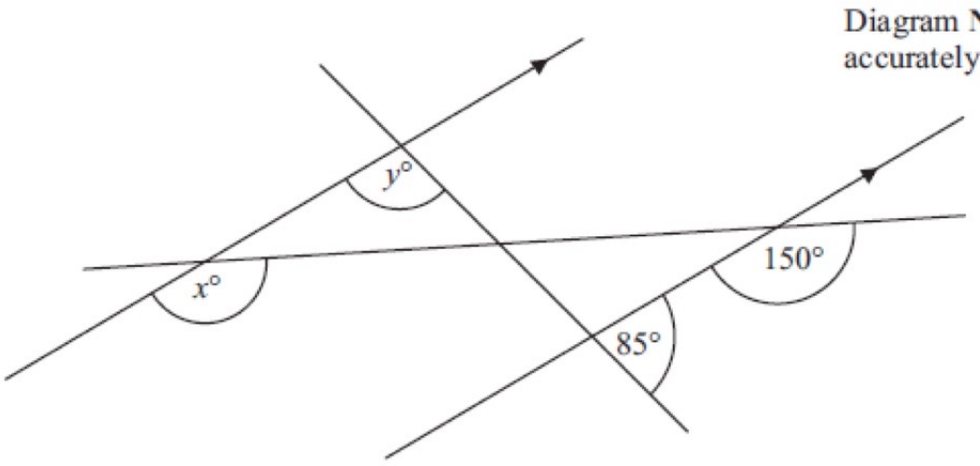
corresponding angle are equal

So, ∠SRD = 113

straight line has 180° so, x + 113 = 180°

(4 marks)

4.



(a) i) Find the value of x.

150

.....

(1)

ii) Give reasons for your answer.

corresponding angles are equal

.....

(1)

(b) i) Find the value of y.

95

.....

(2)

ii) Give reasons for your answer.

Interior alternate angles are equal and straight line has 180°

.....

(2)

(6 marks)

***5.**

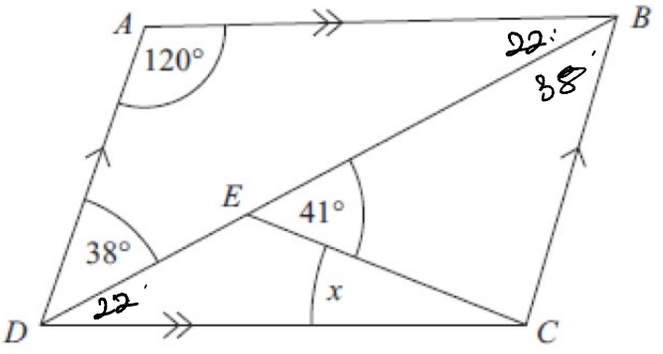


Diagram **NOT** accurately drawn

ABCD is a parallelogram.

Angle *ADB* = 38°.
Angle *BEC* = 41°.
Angle *DAB* = 120°.

Calculate the size of angle *x*.
You must give reasons for your answer.

$\angle ABD = 180 - (120 + 38) = 22°$ (∵ triangle has 180°)

$\angle DBC = 38°$ } (Interior alternate angle)
$\angle BDC = 22$ }

$x = 41 - 22 = 19°$ (Exterior angle of triangle is equal to the sum of opposite side of interior two angle).

(4 marks)

***6.**

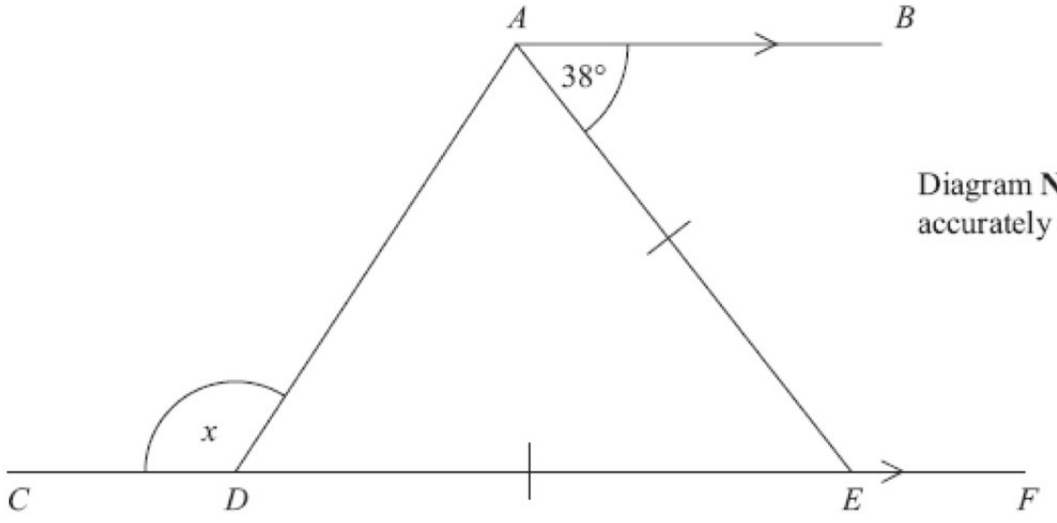


Diagram **NOT** accurately drawn

CDEF is a straight line.
AB is parallel to *CF*.
DE = *AE*.

Work out the size of the angle marked *x*.
You must give reasons for your answer.

$\angle DEA = 38$ (AB // CF, interior alternate angle are equal)

$\angle ADE = \angle DAE = \frac{180-38}{2} = 71$ ($\triangle AED$ is isosceles, AE = ED).

$x = 180 - 71 = 109$ (straight line has 180°)

(4 marks)

*7.

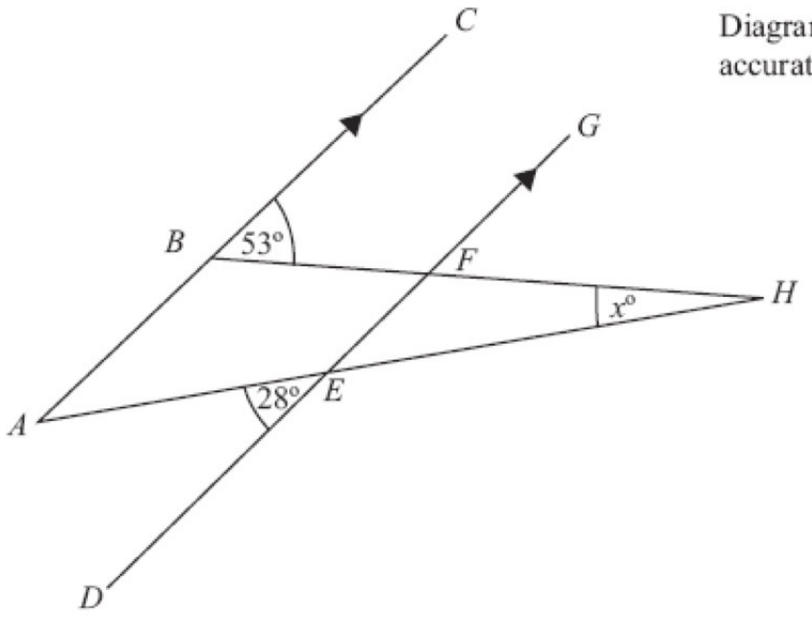


Diagram **NOT** accurately drawn

ABC and *DEFG* are parallel.
AEH and *BFH* are straight lines.
Work out the size of the angle marked $x°$.

$\angle GFH = 53$

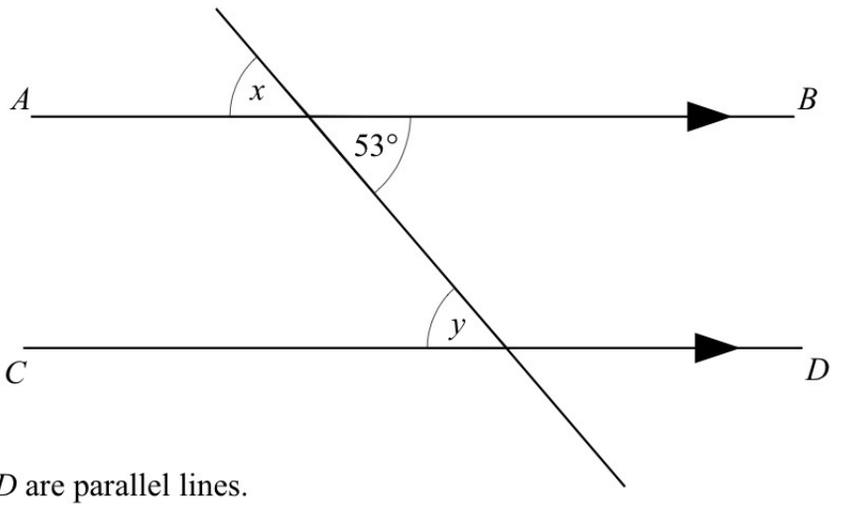
$\angle FEH = 28$

$x = 53 - 28 = 25$

25 .....°

(3 marks)

1



AB and *CD* are parallel lines.

(a) Write down the size of angle *x*.

53 °

(1)

(b) Give a reason for your answer.

opposite angles are equal

(1)

(c) Write down the size of angle *y*.

53 °

(1)

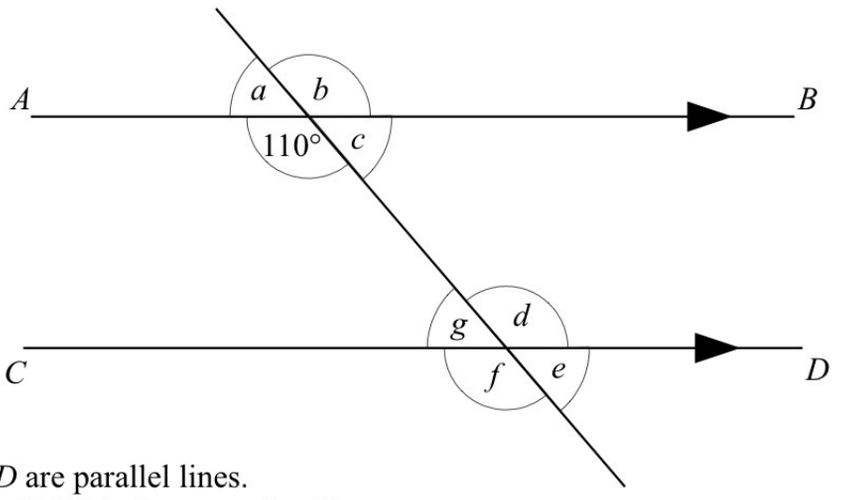
(d) Give a reason for your answer.

Interior alternate angle are equal

(1)

(Total for question 1 is 4 marks)

2



AB and *CD* are parallel lines.
An angle of 110° is shown on the diagram.

(a) Write down the letter of one other angle of size 110°

80

(1)

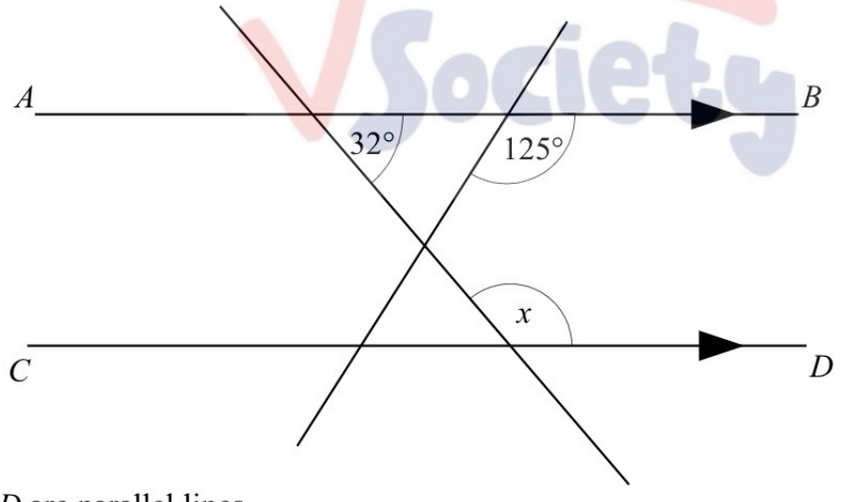
(b) Give a reason for your answer.

Straight line has 180° and the two parallel has following properties: corresponding angle, interior and exterior alternate angle are equal.

(2)

(Total for question 2 is 3 marks)

3



AB and *CD* are parallel lines.

(a) Find the size of angle *x*

148

(1)

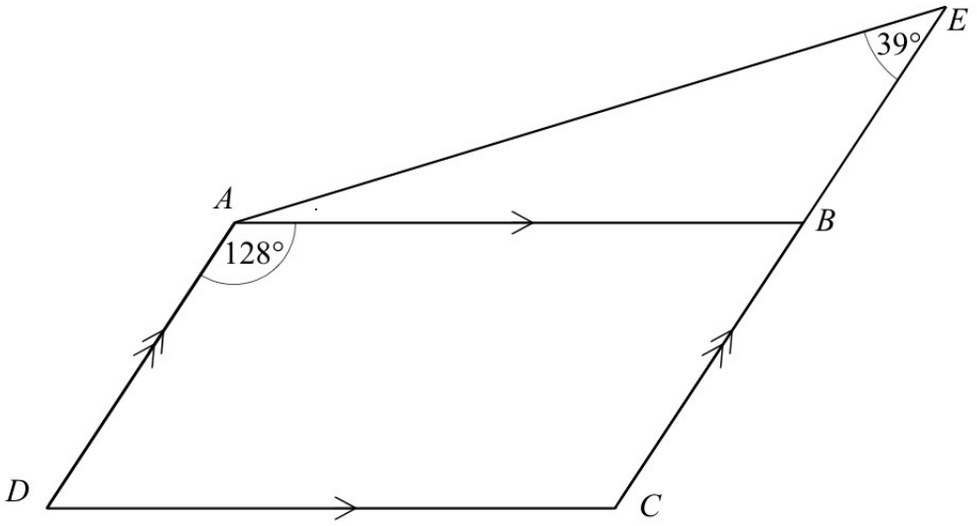
(b) Give a reason for your answer.

Interior alternate angles are equal and straight line has 180°

(2)

(Total for question 3 is 3 marks)

4



ABCD is a parallelogram.
CBE is a straight line.
Angle *BAD* = 128°
Angle *AEB* = 39°

Find the size of angle *BAE*.
Give a reason for each stage of your working.

$\angle ABE = 128^\circ$ (AB // DC, Interior alternate angle are equal).

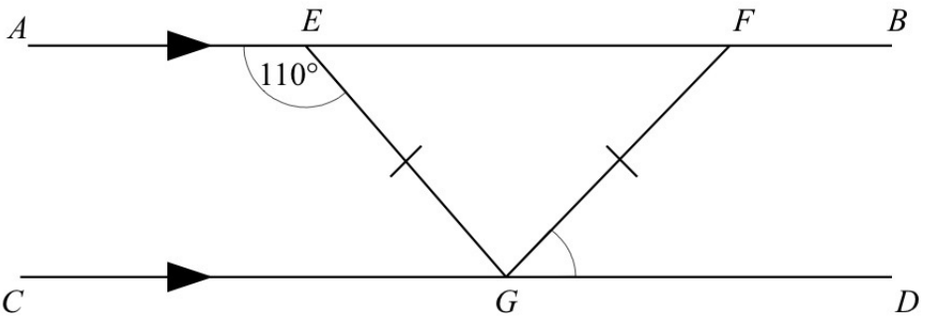
$\angle BAE = 180 - (128 + 39)$

$= 13^\circ$ (∵ triangle has 180°)

.....13°.....

(Total for question 4 is 3 marks)

5



AB and *CD* are parallel lines.
EFG is an isosceles triangle

Angle *AEG* = 110°

Find the size of angle *FGD*.
Give a reason for each stage of your working.

$\angle GEF = 180 - 110$ (straight line)

$= 70$

$\angle GFE = 70$ (ΔGEF is isosceles)

$\angle EGD = 110$ (Interior alternate angle)

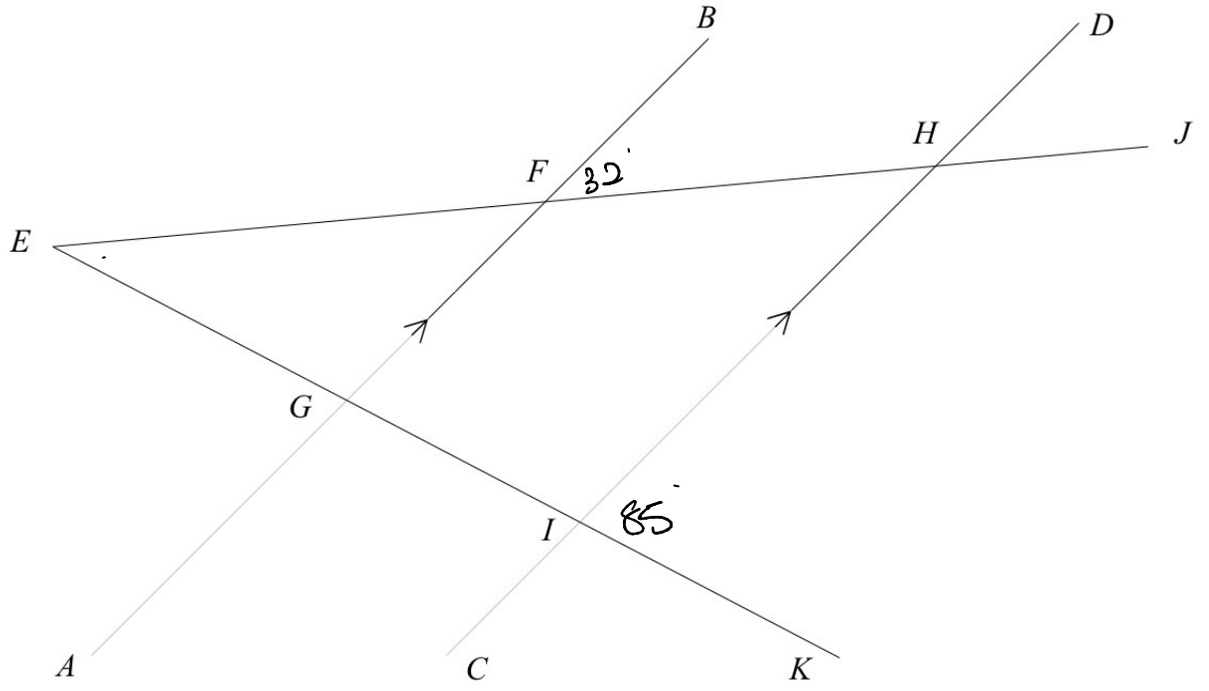
$\angle EGF = 180 - (70 + 70) = 40$ (triangle)

$\angle FGD = 110 - 40 = 70$

70 .....°

(Total for question 5 is 3 marks)

6



AB and *CD* are parallel.
Angle *HIK* = 85°
Angle *BFH* = 32°

Find the size of angle *FEG*.
You must show how you got your answer.

∠GFE = 32° (opposite angles)

∠CIK = 180 − 85 = 95° (straight line)

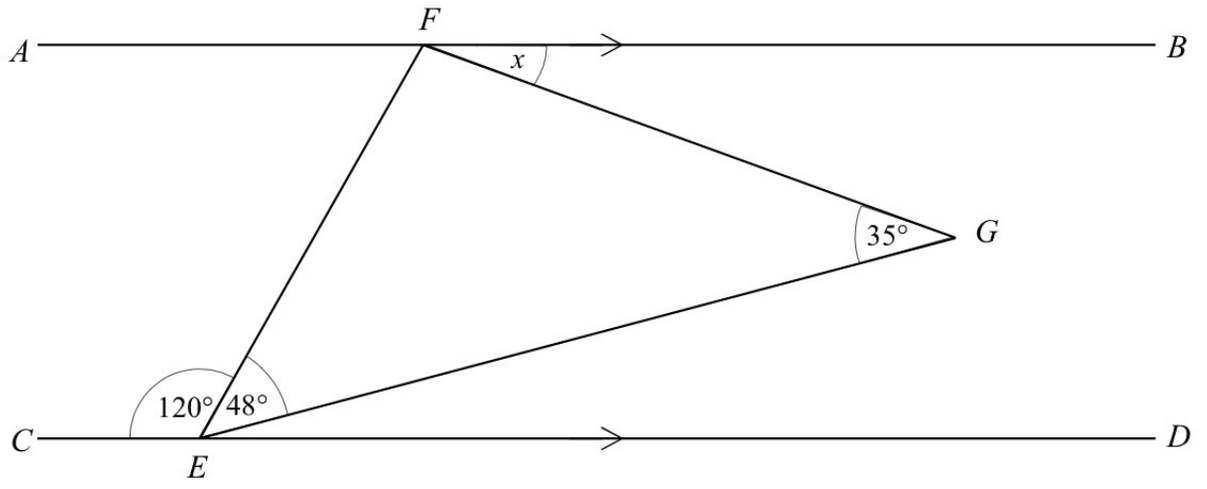
∠FGE = 95° (Exterior alternate angle)

∠FEG = 180 − (95 + 32) = 53°

53 .....°

(Total for question 6 is 3 marks)

7



AB and *CD* are parallel.

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

$\angle DEF = 180 - 120 = 60$ (straight line)

$\angle AFE = 60$ (Interior alternate angle)

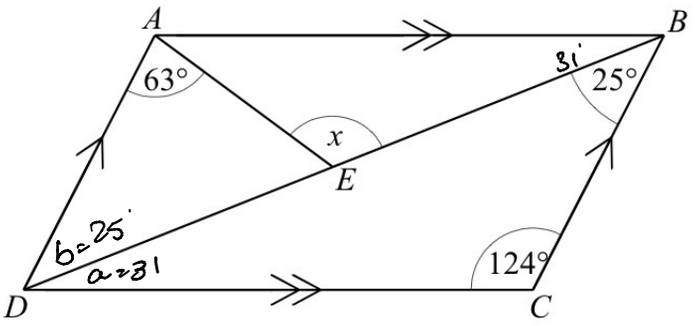
$\angle EFG = 180 - (48 + 35) = 97$ (triangle)

$x = 180 - (60 + 97) = 23$ (straight line)

23 °

(Total for question 7 is 4 marks)

8



ABCD is a parallelogram.

Angle *DAE* = 63°
Angle *BCD* = 124°
Angle *CBD* = 25°

Calculate the size of angle *x*.
Give reasons for each stage of your answer.

$\angle BDC = 180 - (124 + 25) = 31$ (∠ triangle)

$a = 31$ (Interior alternate angle)

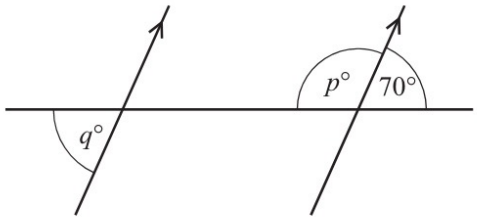
$b = 25$ (" ")

$x = 25 + 63 = 85$ (∠ triangle properties)

85 °

(Total for question 8 is 3 marks)

Question 1



NOT TO SCALE

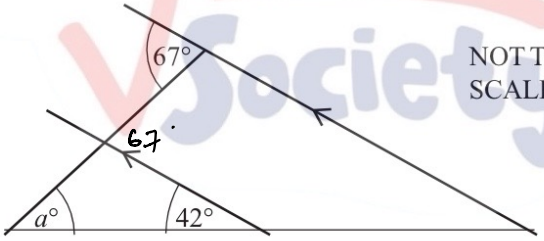
The diagram shows a straight line intersecting two parallel lines.

Find the value of p and the value of q. [2]

$p = 110°$

$q = 70°$

Question 2

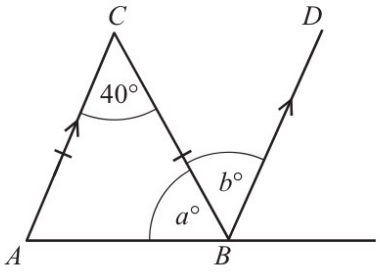


NOT TO SCALE

Find the value of a. [2]

$a = 67 - 42 = 25°$

Question 3



NOT TO SCALE

Triangle ABC is isosceles and AC is parallel to BD.

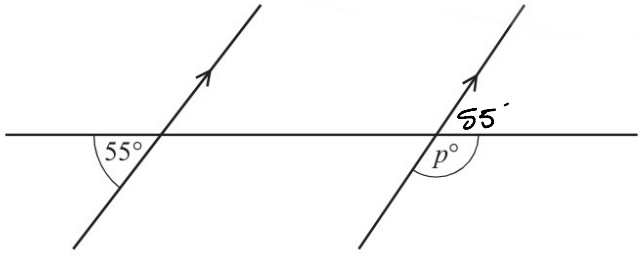
Find the value of a and the value of b.

$a = 70$

$b = 40$

[2]

Question 4



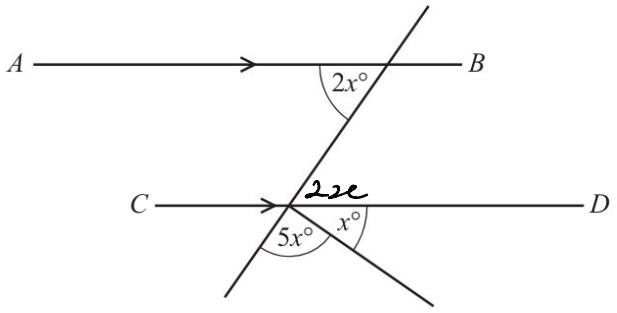
NOT TO SCALE

Find the value of p.

[2]

$p = 180 - 55 = 125$

Question 5



NOT TO SCALE

AB is parallel to *CD*.
Calculate the value of *x*. [3]

$2x + x + 5x = 180^\circ$

$8x = 180^\circ$

$x = 22.5^\circ$