G7a... Angles - Parallel Lines

OCR

6   In the diagram, CDE is parallel to FG.
     ADG and BDF are straight lines.

74°

39°   y

C →   E

67°   D   x   39°

Not to scale

67°

F   G
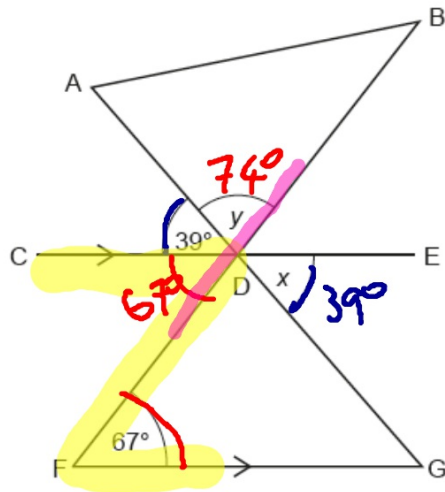
(a) Complete the sentence with a reason.

Angle x = 39° because ...**vertically opposite angles** [1]
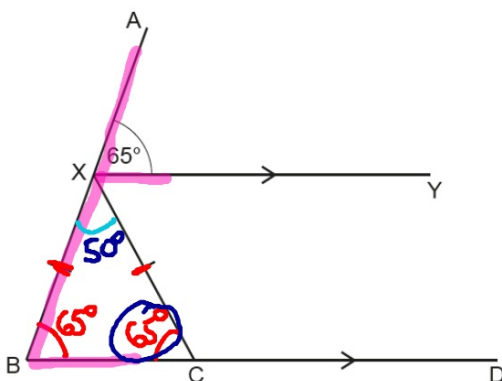**are equal**

(b) Work out angle y.

67 + 39 = 106

180 - 106 =

74°

(b)   ....° [3]

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6   XY and BD are parallel lines.
     X is a point on AB and C is a point on BD.
     XB = XC.

Video created by W Neill

A

65°

X →   Y

50°

65°   65°

B   C →   D

(a) Complete this sentence.

Angle XBC = 65° because ...**Corresponding angles**
are equal

(b) Work out angle BXC.
     Give a reason for each angle you work out.

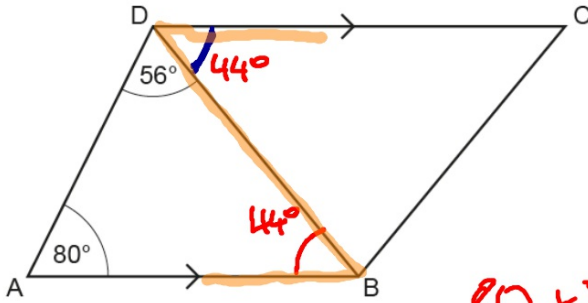• BCX = 65° because base angles
  in an isosceles triangle are equal

• BXC = 50° because angles in a
  triangle = 180°

50°

(b)   ....° [4]

7 In the diagram, AB is parallel to DC.

G5/6/7

56° **44°**

80°

44°

44°

A   B

Not to scale

Work out angle BDC.
Give a <u>reason</u> for each angle you work out.

$80 + 56 = 136$

$180 - 136 = 44°$

• Angle ABD = 44° because angles in a triangle = 180°

• Angle BDC = 44° because alternate angles are equal.

....**44**.........° **[4]**

7 AB and CD are parallel lines.
EF and FB are straight lines.

G7

equal   equal   + to 180°

E

A   70°   B

55°

Not to scale

70°

y   x   **55°**
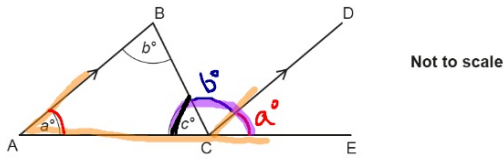
C   F   D
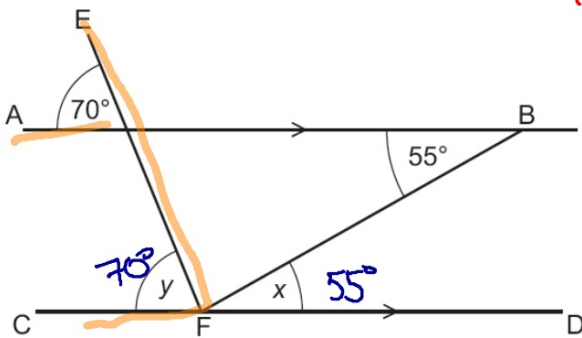
Complete the following statements.

$x = 55°$ because   ......alternate angles are equal......

$y = 70°$ because   ...corresponding angles are equal... **[2]**

9 The diagram shows triangle ABC.
CD is parallel to AB.
A, C and E lie in a straight line.

G7 Angles of size a°, b° and c° are shown.

Not to scale

(b)· Angle ABC = BCD because alternate angles are equal

(a) Insert a°, b° or c° to make this statement true.
Give a reason for your answer.

Angle DCE = ...a.. because ...corresponding angles are equal.

[2]

(b) Use the diagram and the answer to part **(a)** to show that the angles of a triangle
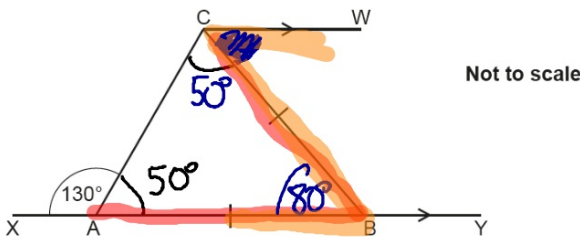add up to 180°.
Give a reason for each statement you make. [3]

• Angles on a straight line = 180°

ⓒ • They share angle c

ⓐ • Angle BAC = DCE because corresponding angles are equal

(b) XY and CW are parallel lines.
AB = CB.

G7

G7b Angle CAX = 130°.

Not to scale

· Angle BCW = 80° because alternate angles are equal

(i) Complete this sentence.

Angle CAB = 50° because ...angles on a straight line = 180°

[1]

(ii) Work out angle BCW.
Give a reason for each angle you work out.

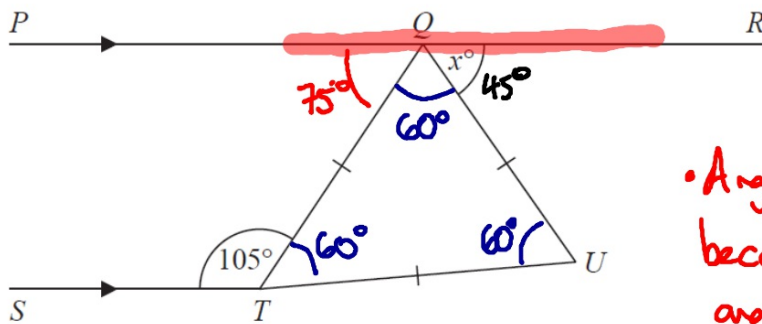Angle ACB = 50° because base angles in an isosceles triangle = 180°

Angle ABC = 80° because angles in a triangle = 180°

(b)(ii) ....80.................. ° [4]

Edexcel

17

G5
G7

P $\longrightarrow$ Q R

75° x° 45°
60°

105° 60° 60° U

S $\longrightarrow$ T

PQR is a straight line parallel to *ST*.
QUT is an equilateral triangle.

Angle *STQ* = 105°

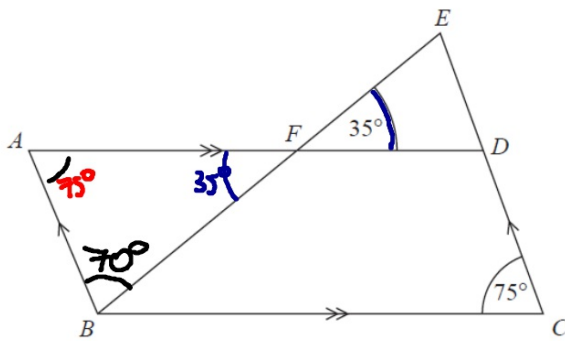Work out the value of *x*.
Give a reason for each stage of your working.

• Angle PQT = 75°
because Co-interior
angles sum to 180°
• Angle TQU = 60° because
QUT is equilateral
• x = 45° because a straight
line sums to 180°

45°

(Total for Question 17 is 4 marks)

E

A $\overset{F}{\underset{}{}}$ 35° D

75° (red annotation)

35° (blue annotation)

70° (black annotation)

75°

B   C

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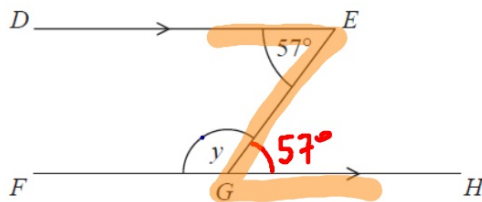*F* is the point on *AD* so that *BFE* is a straight line.

Angle *EFD* = 35°
Angle *DCB* = 75°

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

• Angle BAF = 75°, opposite angles in a parallelogram are equal

• Angle AFB = 35°, vertically opposite angles are equal.

(Total for Question 25 is 4 marks)

William needs to work out the size of angle *y* in this diagram.

D ———————→ E
                        57°

        y   57°
F ———————→   H
        G

William writes

Working	Reason
angle *EGH* = 57°	because corresponding angles are equal
y = 180° − 57° *y* = 123°	because angles on a straight line add up to 180°

One of William's reasons is wrong.

(b) Write down the correct reason.

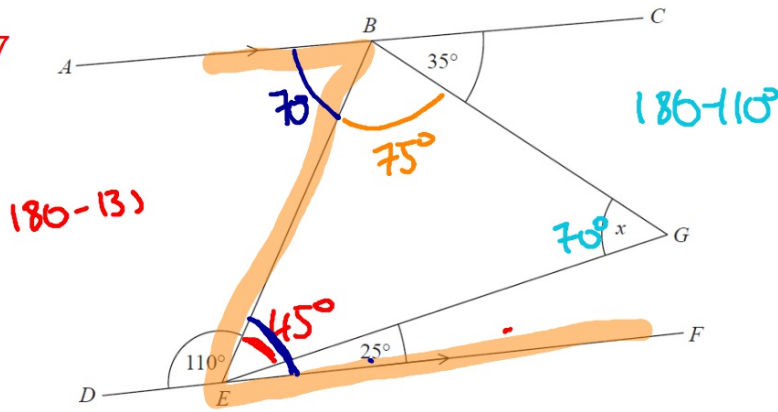G7

because alternate angles are equal.

(1)

22 *BEG* is a triangle.

G7

A · · · · B · · · C
35°
70
75°
180-110
180-13)
45°
110° 25°
D E F
70° x G

ABC and *DEF* are parallel lines.

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

· Angle BEG = 45° angles
on a straight line = 180°
· Angle ABE = 70°, alternate
angles are equal
· Angle EBG = 75°,
angles on a straight
line = 180°
x = 70° angles in a triangle
= 180°

70 °

(Total for Question 22 is 4 marks)

9

A · · · B · · · C
x°
90-½x
90-½x w°
D E F G
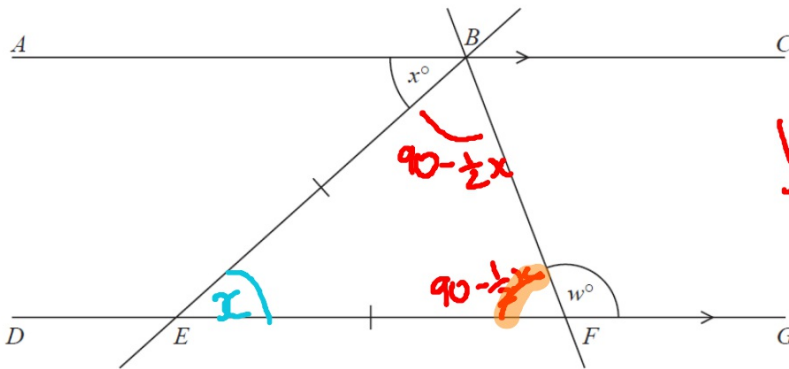
$\dfrac{180-x}{2} = 90 - \dfrac{1}{2}x$

In the diagram *ABC* and *DEFG* are parallel lines.
Angle *ABE* = *x*°
EB = *EF*

Show that $w = 90 + \dfrac{1}{2}x$

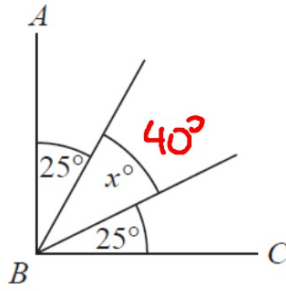Give a reason for each stage of your working.

$90 - \dfrac{1}{2}x + w = 180$
(-90) (-90)

$-\dfrac{1}{2}x + w = 90$
$(+\dfrac{1}{2}x)$ $(+\dfrac{1}{2}x)$

$w = 90 + \dfrac{1}{2}x$

(Total for Question 9 is 4 marks)
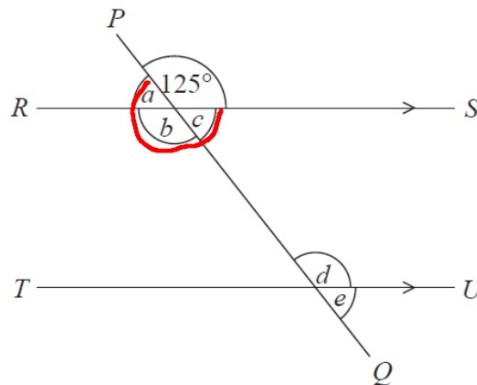
12 *AB* and *BC* are perpendicular lines.

(a) Find the value of *x*.

$$x = \quad 40°$$

(2)

RS and *TU* are parallel lines.
PQ is a straight line.

G4/G7

An angle of size 125° is shown on the diagram.

(b) (i) Write down the letter of one other angle of size 125°
Give a reason for your answer.

d = 125°   corresponding angles are equal.

(ii) Explain why *a* + *b* + *c* = 235°

360 − 125 = 235   Angles at a point = 360°