



# EXAM PAPERS PRACTICE

GCSE OCR Math J560

Angles in Parallel  
Lines

Answers

*"We will help you to  
achieve A Star "*



Answer 1

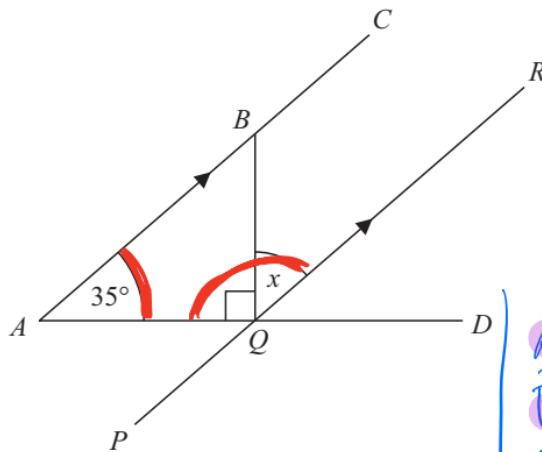


Diagram NOT accurately drawn

$ABC$ ,  $PQR$  and  $AQD$  are straight lines.  
 $ABC$  is parallel to  $PQR$ .

Angle  $BAQ = 35^\circ$   
Angle  $BQA = 90^\circ$

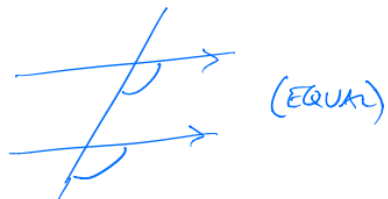
Work out the size of the angle marked  $x$ .  
Give reasons for each stage of your working.

$$\begin{aligned} \hat{AQR} &= 180 - 35 \quad (\text{ALIED ANGLLES}) \\ &= \underline{\underline{145^\circ}} \end{aligned}$$

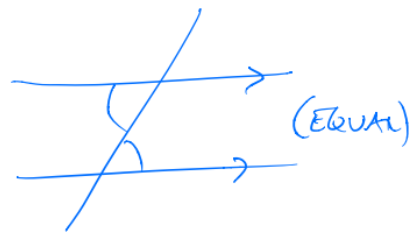
$$\begin{aligned} x &= 145 - 90 \\ &= \underline{\underline{55^\circ}} \end{aligned}$$

ANGLES IN PARALLEL LINES

CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALIED





Answer 2

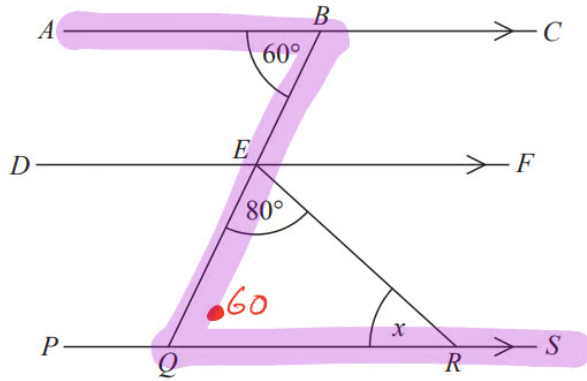


Diagram NOT accurately drawn

$ABC$ ,  $DEF$  and  $PQRS$  are parallel lines.  
 $BEQ$  is a straight line.

Angle  $ABE = 60^\circ$   
Angle  $QER = 80^\circ$

Work out the size of the angle marked  $x$ .  
Give reasons for each stage of your working.

$$\hat{EQR} = \hat{ABE} = 60^\circ \text{ (ALTERNATE ANGLES)}$$

$$80 + 60 + x = 180 \text{ (ANGLES IN A TRIANGLE)}$$

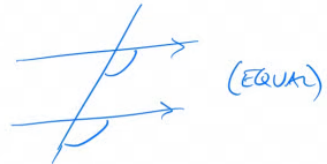
$$140 + x = 180 \text{ (ADD TO 180)}$$

$$\begin{array}{r} 140 \\ -140 \\ \hline \end{array} \quad \begin{array}{r} +x \\ -140 \\ \hline \end{array}$$

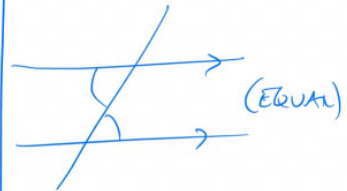
$$\underline{\underline{x = 40^\circ}}$$

ANGLES IN PARALLEL LINES

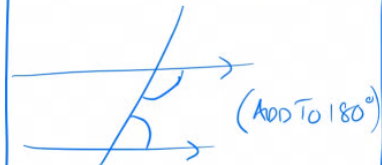
CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALLIED





Answer 3

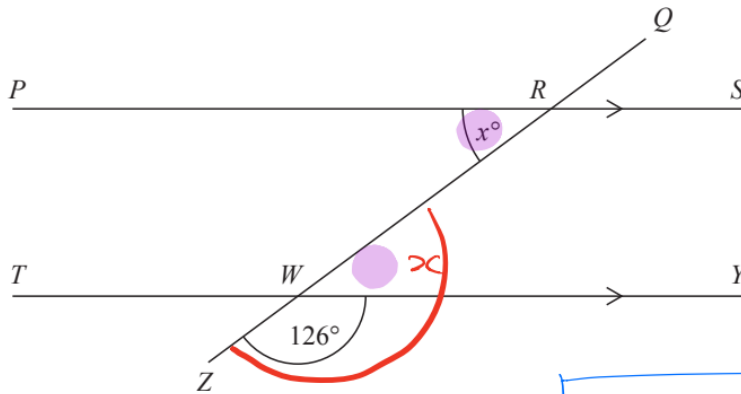


Diagram NOT accurately drawn

PRS and TWY are parallel straight lines.  
QRWZ is a straight line.

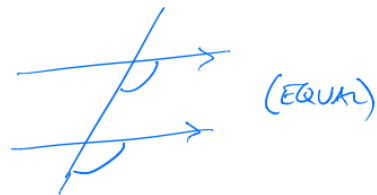
Work out the value of  $x$ .  
Give reasons for your answer.

$$\begin{aligned}\hat{QWY} &= 180 - 126 \\ &= \underline{54^\circ} \quad (\text{STRAIGHT LINE})\end{aligned}$$

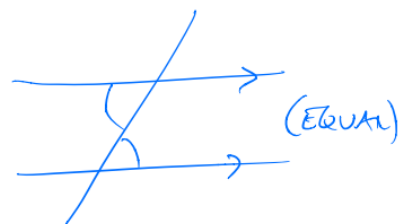
$$\text{So } x = \underline{54^\circ} \quad (\text{ALTERNATE ANGLES})$$

ANGLES IN PARALLEL LINES

CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALLIED





Answer 4

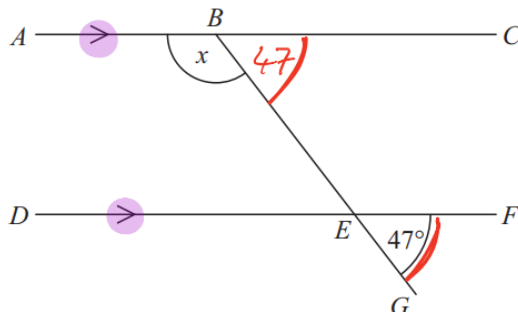


Diagram NOT accurately drawn

$ABC$  and  $DEF$  are parallel lines.  
 $BEG$  is a straight line.  
Angle  $GEF = 47^\circ$ .

Work out the size of the angle marked  $x$ .  
Give reasons for your answer.

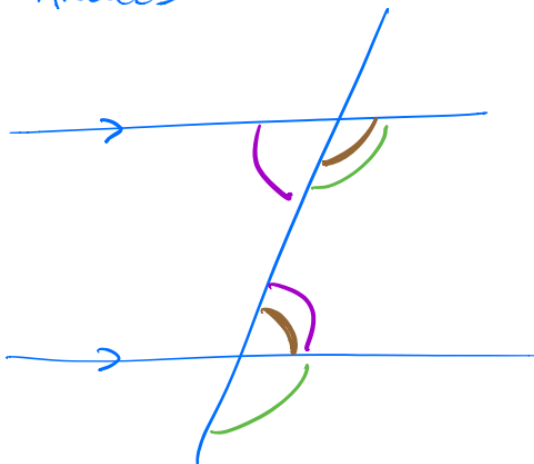
$$\hat{GBC} = 47 \text{ (CORRESPONDING ANGLES)}$$

$$x + 47 = 180 \text{ (STRAIGHT LINE)}$$

$$x = 180 - 47$$

$$x = \underline{\underline{133^\circ}}$$

ANGLES - PARALLEL LINES



CORRESPONDING ANGLES (F)

ALTERNATE ANGLES (Z)

CO-INTERIOR ANGLES (C)  
(ADD TO 180)

133 °



Answer 5

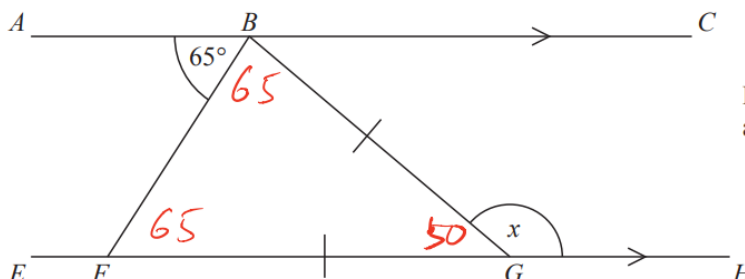


Diagram NOT accurately drawn

$ABC$  is parallel to  $EFGH$ .

$GB = GF$   
Angle  $ABF = 65^\circ$

Work out the size of the angle marked  $x$ .  
Give reasons for your answer.

ANGLES IN PARALLEL LINES

CORRESPONDING:

(EQUAL)

ALTERNATE:

(EQUAL)

CO-INTERIOR / ALLIED

(ADD TO  $180^\circ$ )

$\hat{BFG} = \hat{ABF} = 65^\circ$  (ALTERNATE ANGLES)

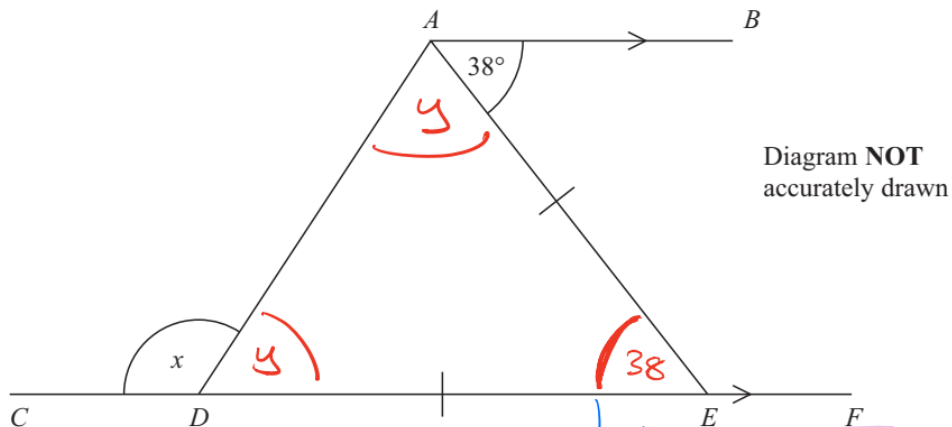
$\hat{FBG} = \hat{BFG} = 65^\circ$  (ISOSCELES TRIANGLE)

$\hat{BGF} = 180 - 65 - 65$   
 $= 180 - 130$   
 $= 50^\circ$  (ANGLES IN A TRIANGLE)

$x = 180 - 50$   
 $= \underline{130^\circ}$  (ANGLES ON A STRAIGHT TRIANGLE)



Answer 6



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.

$$\hat{AED} = \underline{38^\circ} \quad (\text{ALTERNATE ANGLÉS ARE EQUAL})$$

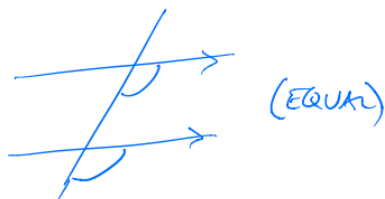
$$\begin{aligned} y &= \frac{1}{2}(180 - 38) \quad (\text{ISOSCELES TRIANGLE}) \\ &= \frac{1}{2}(142) \\ &= \underline{71} \end{aligned}$$

$$x + y = 180 \quad (\text{STRAIGHT LINE})$$

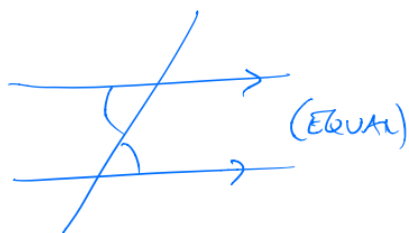
$$\begin{aligned} x &= 180 - 71 \\ &= \underline{\underline{109^\circ}} \end{aligned}$$

ANGLES IN PARALLEL LINES

CORRESPONDING ANGLES



ALTERNATE ANGLES



CO-INTERIOR / ALLIED ANGLES





Answer 7

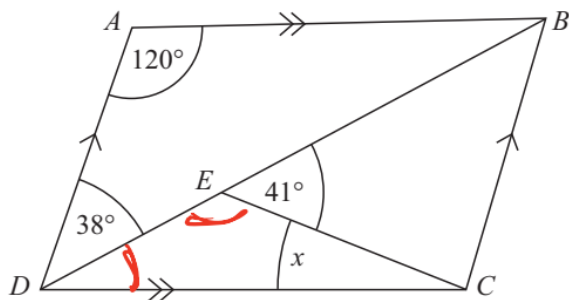


Diagram NOT accurately drawn

$ABCD$  is a parallelogram.

Angle  $ADB = 38^\circ$ .

Angle  $BEC = 41^\circ$ .

Angle  $DAB = 120^\circ$ .

Calculate the size of angle  $x$ .

You must give reasons for your answer.

$$\begin{aligned}\hat{ADC} &= 180 - \hat{DAB} \\ &= 180 - 120 \\ &= \underline{\underline{60^\circ}} \quad (\text{ALLIED ANGLES})\end{aligned}$$

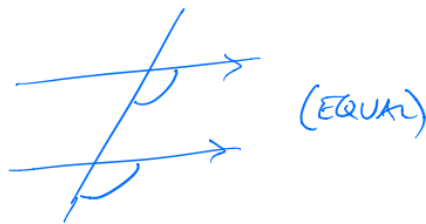
$$\begin{aligned}\hat{EDC} &= 60 - 38 \\ &= \underline{\underline{22^\circ}}\end{aligned}$$

$$\begin{aligned}\hat{DEC} &= 180 - 41 \\ &= \underline{\underline{139^\circ}} \quad (\text{STRAIGHT LINE})\end{aligned}$$

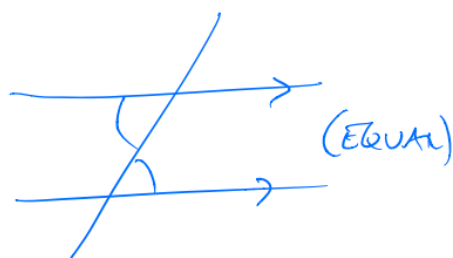
$$\begin{aligned}x &= 180 - (22 + 139) \\ &= \underline{\underline{19^\circ}} \quad (\text{ANGLES IN A TRIANGLE})\end{aligned}$$

ANGLES IN PARALLEL LINES

CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALLIED







Answer 8

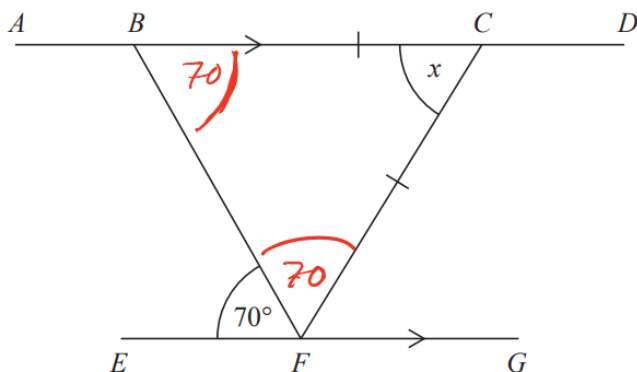


Diagram NOT accurately drawn

ABCD and EFG are parallel lines.  
 $BC = CF \rightarrow$  CBF is ISOSCELES  
Angle BFE =  $70^\circ$

Work out the size of the angle marked  $x$ .  
Give reasons for each stage of your working.

$$\hat{CBF} = \hat{BFE} = 70^\circ \text{ (ALTERNATE ANGLES)}$$

$$\hat{CFB} = 70^\circ \text{ (ISOSCELES TRIANGLE)}$$

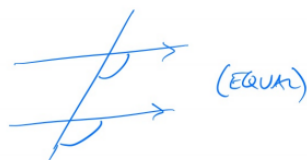
$$x + 70 + 70 = 180 \text{ (ANGLES IN A TRIANGLE)}$$

$$x + 140 = 180$$
$$\begin{array}{r} -140 \\ -140 \end{array}$$

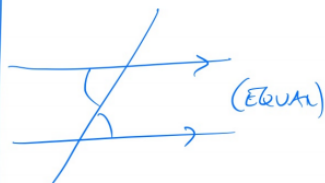
$$\underline{\underline{x = 40^\circ}}$$

ANGLES IN PARALLEL LINES

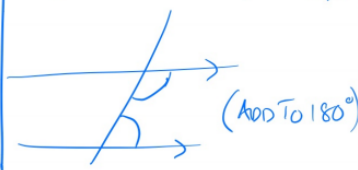
CORRESPONDING:



ALTERNATE:

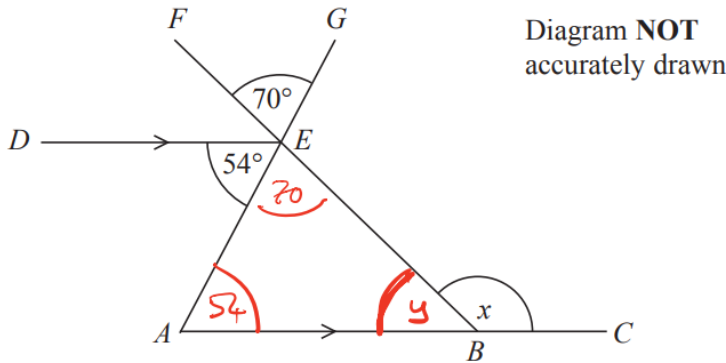


CO-INTERIOR (ALIED)





Answer 9



$ABC$  and  $DE$  are parallel lines.  
 $AEG$  and  $BEF$  are straight lines.

Angle  $AED = 54^\circ$   
Angle  $FEG = 70^\circ$

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

$$\hat{EAB} = \hat{DEA} = 54^\circ \text{ (ALTERNATE ANGLES)}$$

$$\hat{AEB} = \hat{FEG} = 70^\circ \text{ (OPPOSITE ANGLES)}$$

$$y + 54 + 70 = 180 \text{ (ANGLES IN } \Delta)$$

$$y + 124 = 180$$
$$\begin{array}{r} -124 \quad -124 \\ \hline \end{array}$$

$$y = 56^\circ$$

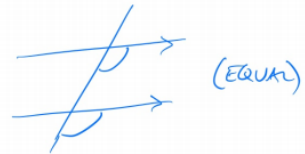
$$x + y = 180 \text{ (STRAIGHT LINE)}$$
$$\begin{array}{r} -56 \quad -56 \\ \hline \end{array}$$

$$x = 180 - 56$$

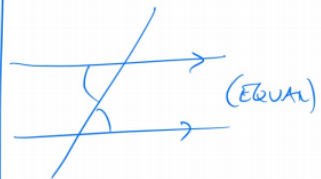
$$x = \underline{\underline{124}}$$

ANGLES IN  
PARALLEL LINES

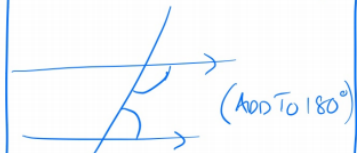
CORRESPONDING:



ALTERNATE:

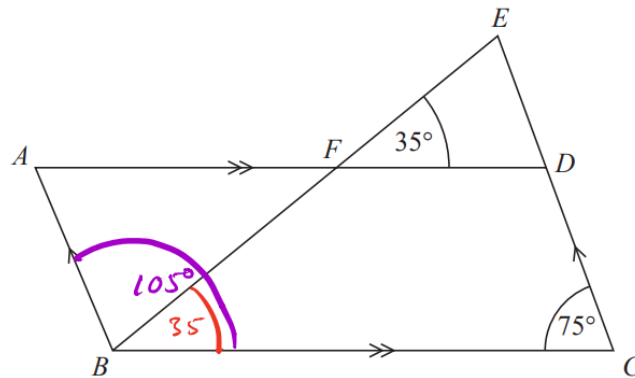


CO-INTERIOR / ALLIED





Answer 10



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

Angle  $EFD = 35^\circ$   
Angle  $DCB = 75^\circ$

Show that angle  $ABF = 70^\circ$   
Give a reason for each stage of your working.

$$\hat{FBC} = \hat{EFD} = \underline{35^\circ} \text{ (CORRESPONDING ANGLES)}$$

$$\begin{aligned} \hat{ABC} &= 180 - \hat{DCB} \text{ (ALTERNATE ANGLES)} \\ &= 180 - 75 \\ &= \underline{105^\circ} \end{aligned}$$

$$\begin{aligned} \hat{ABF} &= \hat{ABC} - \hat{FBC} \\ &= 105 - 35 \\ &= \underline{\underline{70^\circ}} \end{aligned}$$

ANGLES IN PARALLEL LINES

CORRESPONDING:

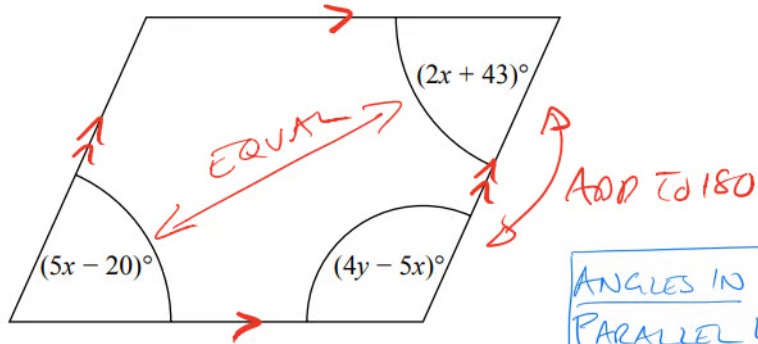
ALTERNATE:

CO-INTERIOR / ALIED



**Answer 11**

Here is a parallelogram.



Work out the value of  $x$  and the value of  $y$ .

$$\begin{array}{r} 5x - 20 = 2x + 43 \\ -2x \quad \quad -2x \end{array}$$

$$\begin{array}{r} 3x - 20 = 43 \\ +20 \quad \quad +20 \end{array}$$

$$\frac{3x}{3} = \frac{63}{3}$$

$$\underline{x = 21}$$

$$\begin{array}{r} 4y - 5x + 2x + 43 = 180 \\ \quad \quad -43 \quad \quad -43 \end{array}$$

$$4y - 3x = 137$$

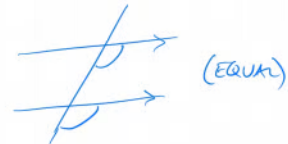
$$\begin{array}{r} 4y - 63 = 137 \\ \quad +63 \quad \quad +63 \end{array}$$

$$\frac{4y}{4} = \frac{200}{4}$$

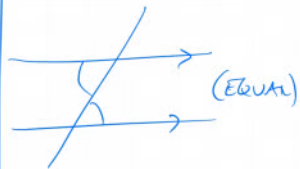
$$\underline{y = 50}$$

ANGLES IN PARALLEL LINES

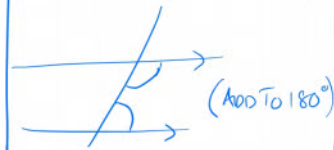
CORRESPONDING:



ALTERNATE:

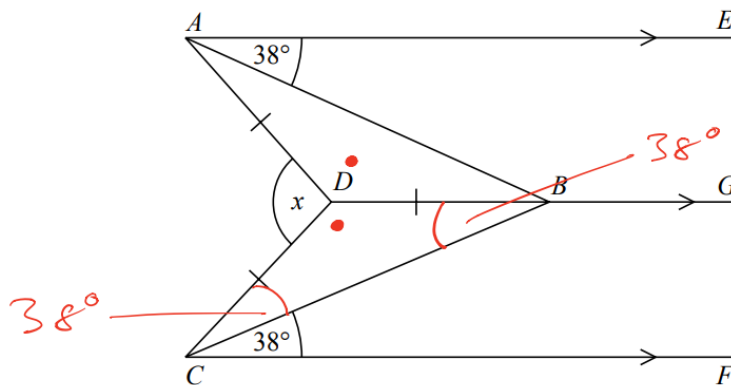


CO-INTERIOR / ALLED





Answer 12



$AE$ ,  $DBG$  and  $CF$  are parallel.  
 $DA = DB = DC$ .  
Angle  $EAB = \text{angle } BCF = 38^\circ$

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

$$\hat{D}BC = \underline{38^\circ} \text{ (ALTERNATE ANGLES)}$$

$$\hat{C}DB = 180 - 2 \times 38 \text{ (ISOSCELES } \Delta)$$

$$= 180 - 76$$

$$= \underline{104^\circ}$$

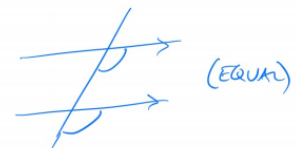
$$x = 360 - 2 \times 104 \text{ (CIRCLE)}$$

$$= 360 - 208$$

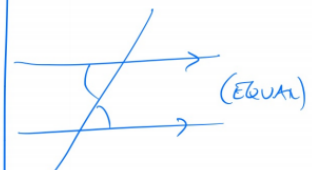
$$= \underline{\underline{152^\circ}}$$

ANGLES IN  
PARALLEL LINES

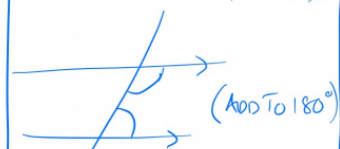
CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALLIED





Answer 13

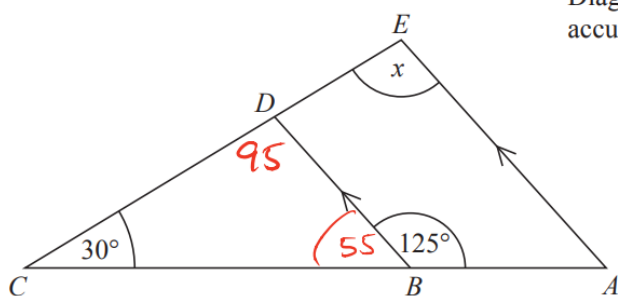


Diagram NOT accurately drawn

$ABC$  and  $EDC$  are straight lines.  
 $AE$  and  $BD$  are parallel.  
Angle  $ABD = 125^\circ$   
Angle  $BCD = 30^\circ$

Work out the size of the angle marked  $x$ .  
Give reasons for your answer.

$$\begin{aligned}\hat{D}BC &= 180 - 125 \text{ (STRAIGHT LINE)} \\ &= \underline{55^\circ}\end{aligned}$$

$$\begin{aligned}\hat{B}DC &= 180 - 30 - 55 \text{ (ANGLES IN A TRIANGLE)} \\ &= 150 - 55 \\ &= \underline{95^\circ}\end{aligned}$$

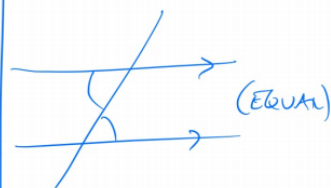
$$\angle C = \hat{B}DC = \underline{\underline{95^\circ}} \text{ (CORRESPONDING ANGLES)}$$

ANGLES IN PARALLEL LINES

CORRESPONDING:



ALTERNATE:



CO-INTERIOR / ALLIED

