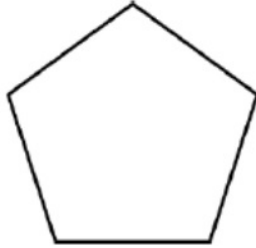


## G5...Angles - Angles in a Triangle

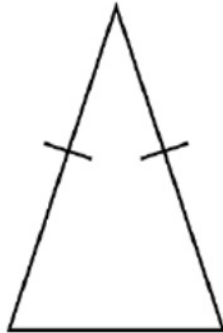
OCR

1 (a) Write down the mathematical name for this shape.



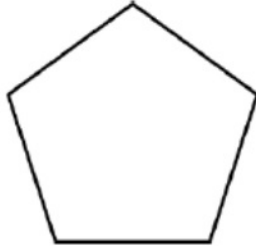
(a) .....[1]

(b) Write down the mathematical name of this triangle.



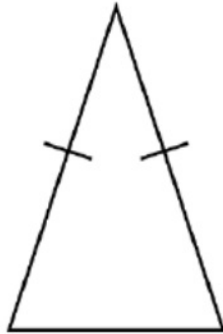
(b) .....[1]

1 (a) Write down the mathematical name for this shape.



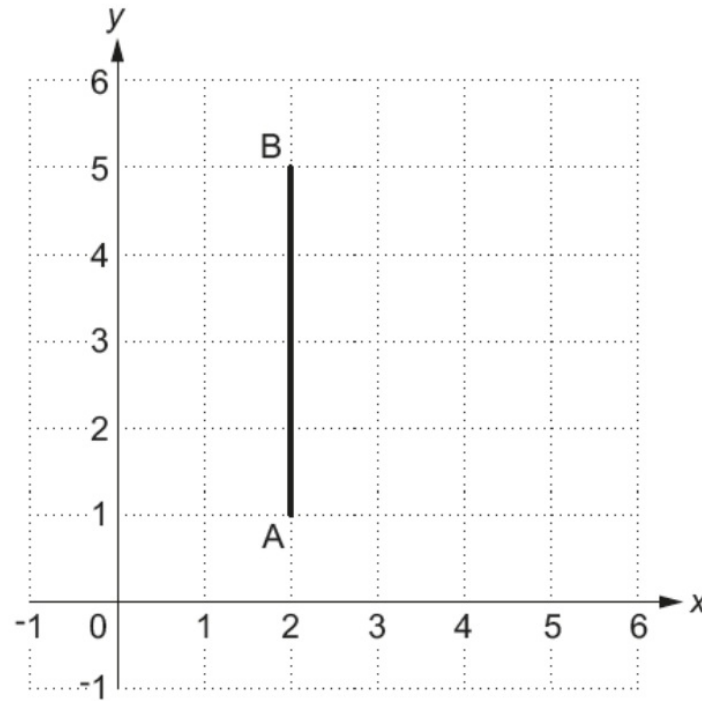
(a) Pentagon [1]

(b) Write down the mathematical name of this triangle.



Isosceles triangle  
(b) ..... [1]

6 The line joining A (2, 1) to B (2, 5) is drawn on a one centimetre grid.



(a) AB is the **longest** side of a right-angled isosceles triangle, ABC.

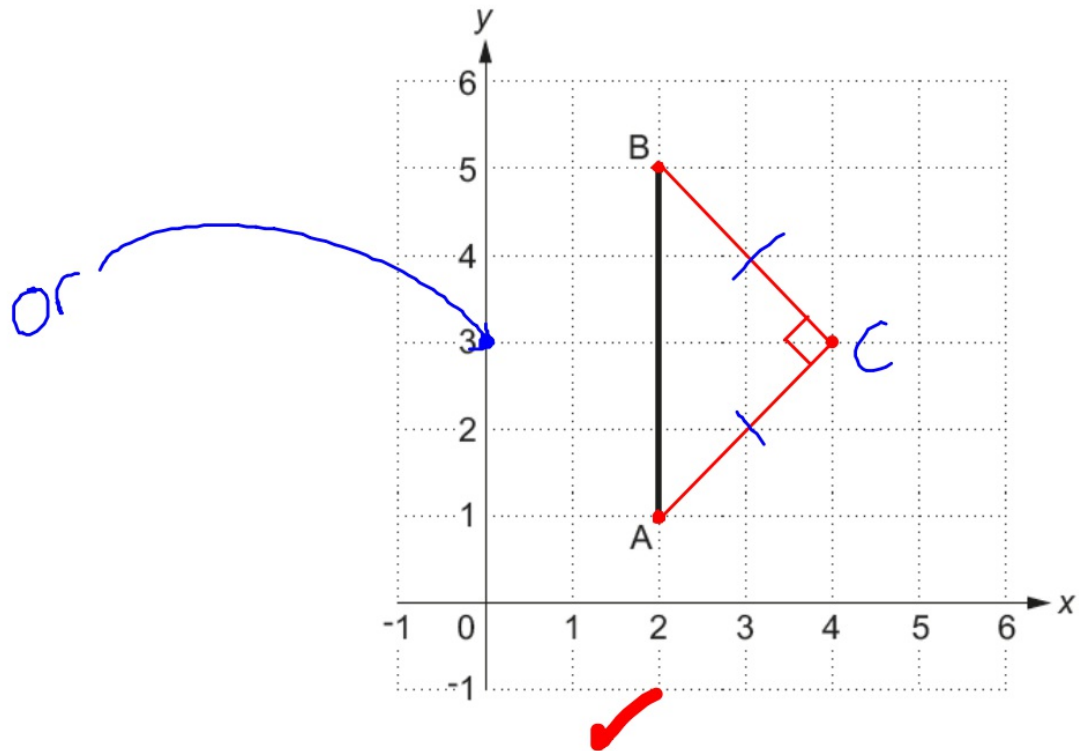
(i) Mark a position for point C on the diagram.

[1]

(ii) Write down the coordinates of point C.

(a)(ii) (....., .....) [1]

6 The line joining A (2, 1) to B (2, 5) is drawn on a one centimetre grid.



(a) AB is the longest side of a right-angled isosceles triangle, ABC.

(i) Mark a position for point C on the diagram.

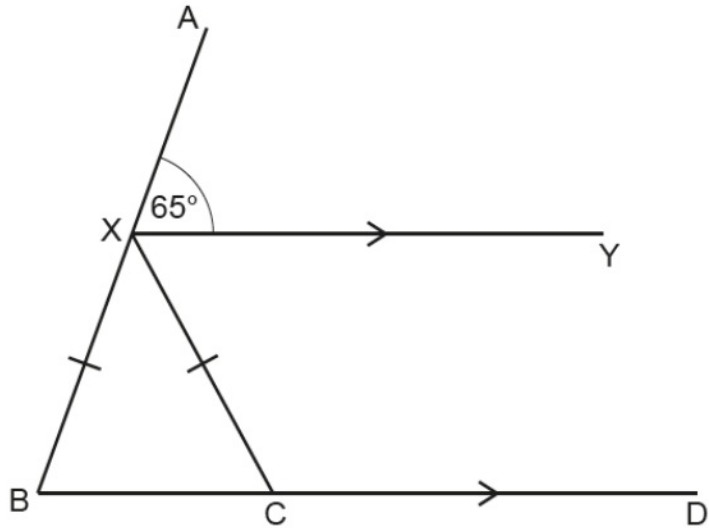
[1]

(ii) Write down the coordinates of point C.

(a)(ii) (.....4....., .....3.....) [1]

- 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

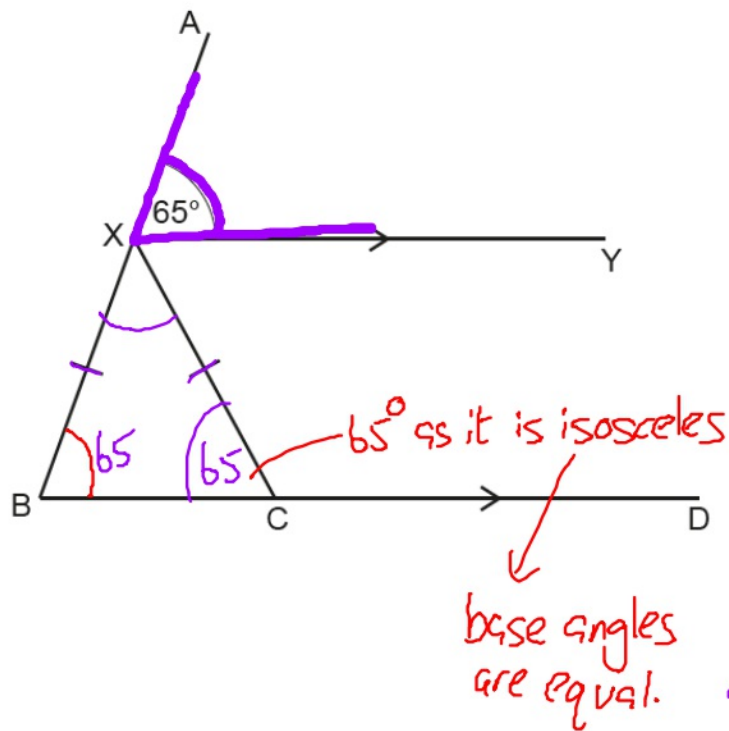


- (a) Complete this sentence.  
 Angle XBC =  $65^\circ$  because .....
- (b) Work out angle BXC.  
 Give a reason for each angle you work out.

(b) .....  $^\circ$  [4]

- 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

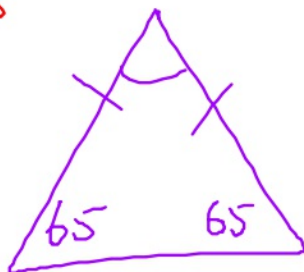


- (a) Complete this sentence.

Angle XBC =  $65^\circ$  because *it corresponds with angle AXY*

- (b) Work out angle BXC.

Give a reason for each angle you work out.



$65 + 65 = 130^\circ$   
 $180^\circ - 130^\circ = 50^\circ$  ✓ because angles in a  $\Delta$  add up to  $180^\circ$ .

(b) ..... 50 .....  $^\circ$  [4]



Created by W Neill

**19** The angles in a triangle are in the ratio 1 : 2 : 3.

**(a)** Show that the triangle is a right-angled triangle.

**[2]**

**(b)** The hypotenuse of the triangle is 15 cm long.

Calculate the length of the shortest side in the triangle.

**(b)** ..... cm **[4]**

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle.

[2]

$180^\circ$

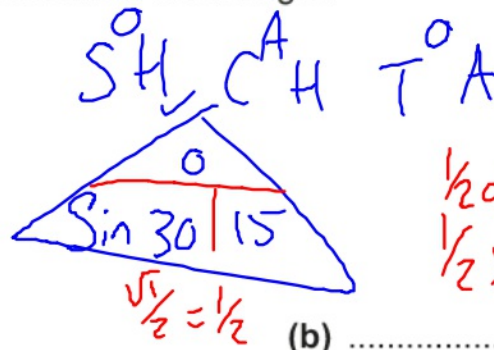
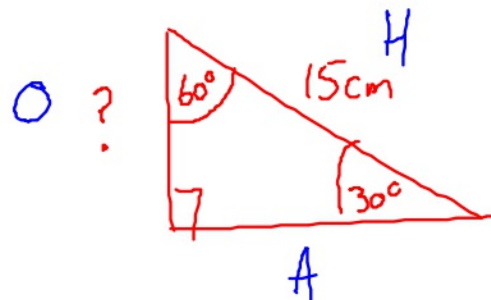
$180^\circ \dots 1 : 2 : 3$

$\div 6 \left\{ \begin{array}{l} 180^\circ = 6 \text{ parts} \\ 30^\circ \quad 1 \text{ part} \end{array} \right. \div 6$

$15\text{cm}$   
 $1 : 2 : 3$   
 $\swarrow \quad \downarrow \quad \searrow$   
 $30 \quad 60 \quad 90^\circ$   
 Right angled as it has  $90^\circ$

(b) The hypotenuse of the triangle is 15cm long.

Calculate the length of the shortest side in the triangle.



$\frac{1}{2}$  of 15  
 $\frac{1}{2} \times 15$

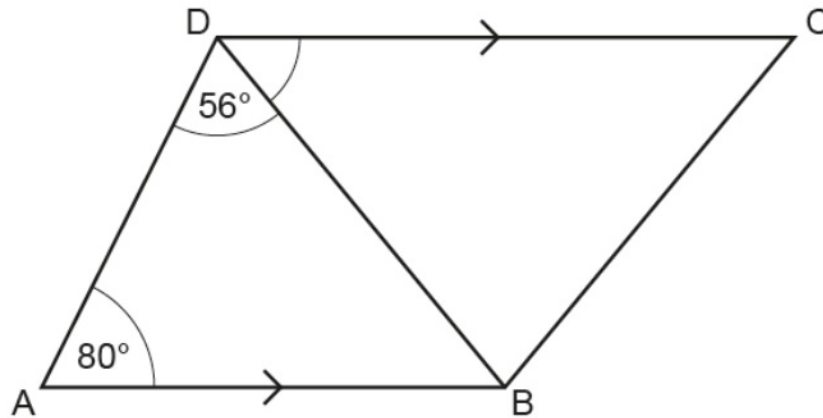


$= 7.5$

(b) ..... cm [4]

7 In the diagram, AB is parallel to DC.

GS/6/7



Created by W Neill

Not to scale

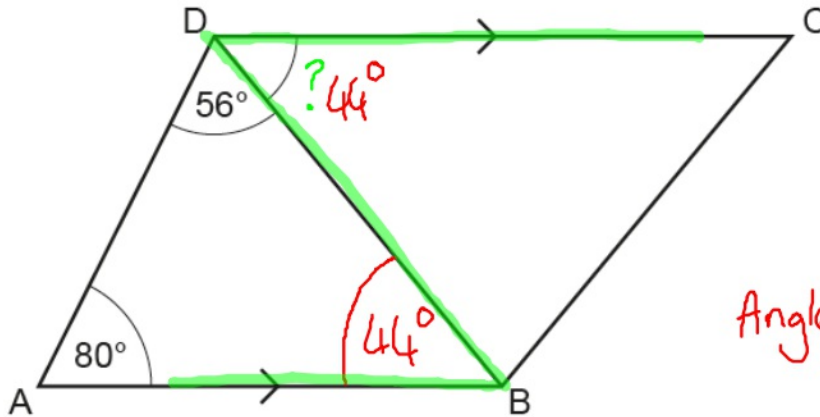
Work out angle BDC.  
Give a reason for each angle you work out.

.....° [4]

7 In the diagram, AB is parallel to DC.

Created by W Neill

GS/6/7



$$180 - \frac{80 + 56}{136} = 44^\circ$$

Not to scale

Angle ABD =  $44^\circ$  ... angles in a triangle add to  $180^\circ$

Angle BDC =  $44^\circ$  as it is alternate ( $\angle$ ) with ABD

Work out angle BDC.  
Give a reason for each angle you work out.

..... 44 .....  $^\circ$  [4]

1 (a) Write down the mathematical name of this triangle.

65

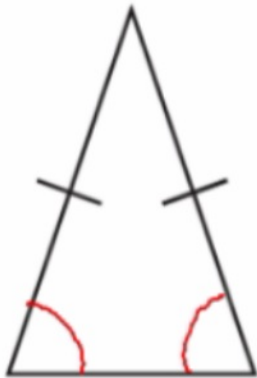


isosceles equilateral right-angled scalene

(a) .....triangle [1]

- 1 (a) Write down the mathematical name of this triangle.  
Choose from the list in the box.

65

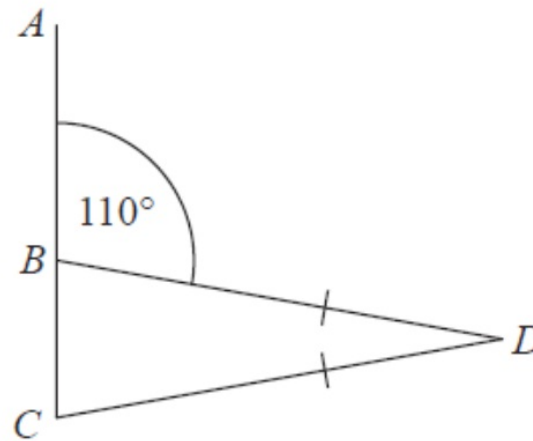


isosceles equilateral right-angled scalene

(a) Isosceles.....triangle [1]

Edexcel

15



$ABC$  is a straight line.

$BD = CD$

Angle  $ABD = 110^\circ$

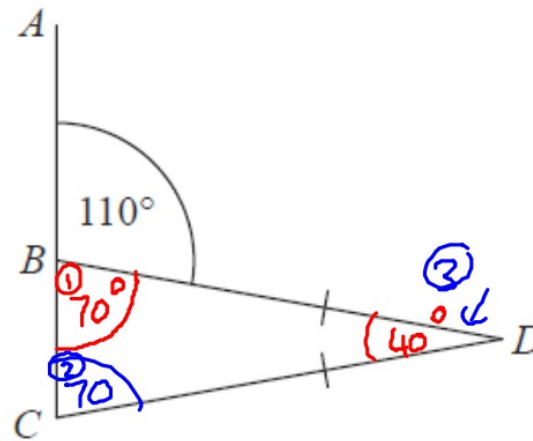
Show that angle  $BDC = 40^\circ$

Give a reason for each stage of your working.

(Total for Question 15 is 4 marks)



15



$ABC$  is a straight line.  
 $BD = CD$   
 Angle  $ABD = 110^\circ$

Show that angle  $BDC = 40^\circ$

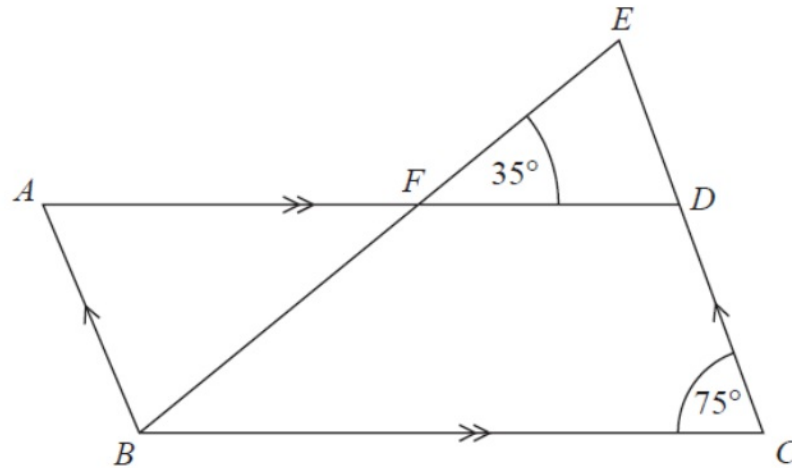
Give a reason for each stage of your working.

①  $\rightarrow 70^\circ$  because angles on a straight line add to  $180^\circ$

②  $\rightarrow 70^\circ$  as triangle  $BCD$  is isosceles and both base angles are equal

③ Angle  $BDC = 40^\circ$  as angles in a triangle add to  $180^\circ$

(Total for Question 15 is 4 marks)



$ABCD$  is a parallelogram.

$EDC$  is a straight line.

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

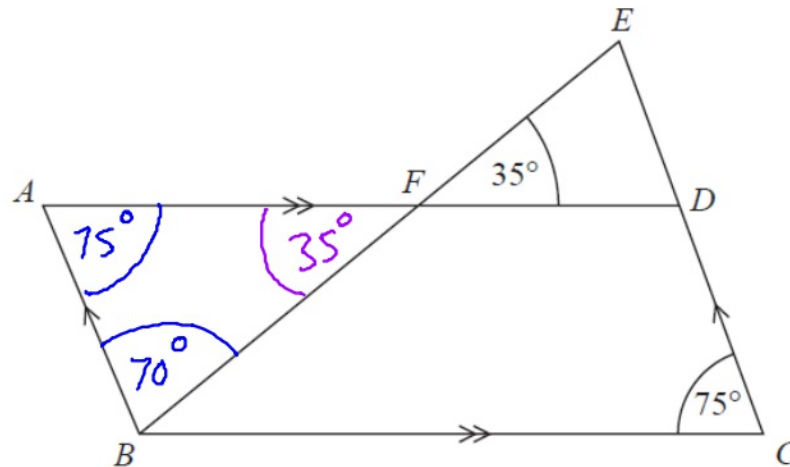
Angle  $EFD = 35^\circ$

Angle  $DCB = 75^\circ$

Show that angle  $ABF = 70^\circ$

Give a reason for each stage of your working.

(Total for Question 25 is 4 marks)



$ABCD$  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.

Angle  $BAF = 75^\circ$  as  
opposite angles are equal  
in a parallelogram



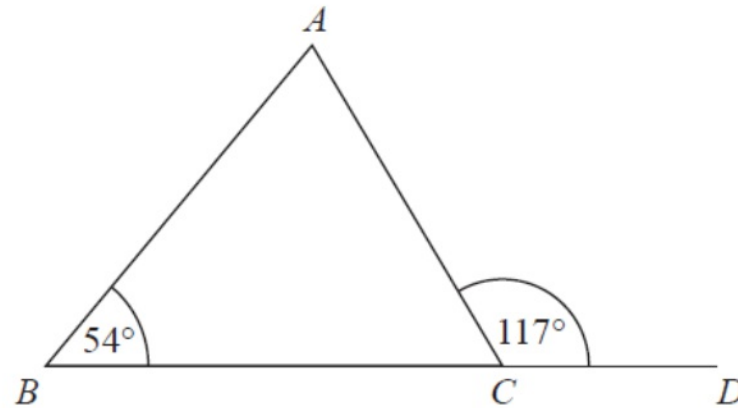
Angle  $AFB = 35^\circ$  as  
vertically opposite angles are  
equal

Angle  $ABF = 70^\circ$  as angles in a  $\triangle$  add up  
to  $180^\circ$   
 $75 + 70 + 35 = 180^\circ$  ✓

(Total for Question 25 is 4 marks)

7

Created by W Neill



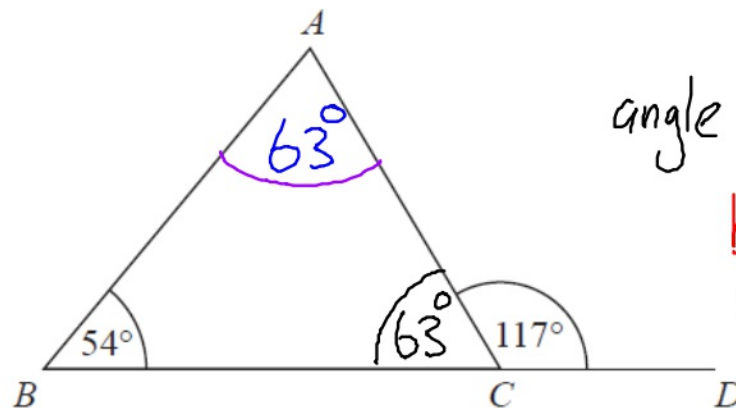
$BCD$  is a straight line.

$ABC$  is a triangle.

Show that triangle  $ABC$  is an isosceles triangle.

Give a reason for each stage of your working.

(Total for Question 7 is 4 marks)



$$\text{angle } ACB = 63^\circ$$

because angles on a straight line add to  $180^\circ$

$BCD$  is a straight line.  
 $ABC$  is a triangle.

Show that triangle  $ABC$  is an isosceles triangle.  
 Give a reason for each stage of your working.

$$\text{angle } BAC = 63^\circ$$

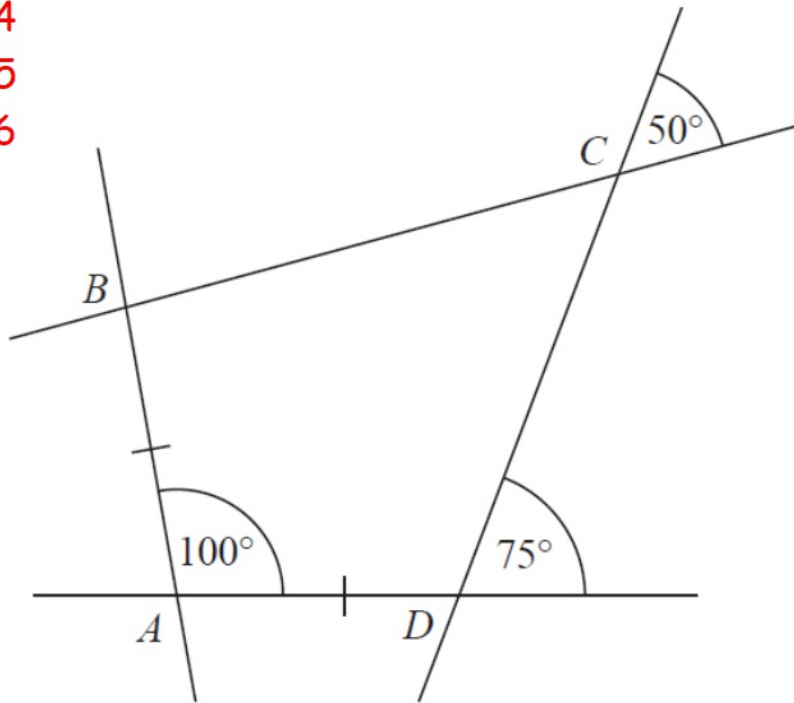
because angles in a  $\triangle$  add to  $180^\circ$

This is an isosceles triangle as it has two angles that are equal.

(Total for Question 7 is 4 marks)

14 The diagram shows quadrilateral  $ABCD$  with each of its sides extended.

G4  
G5  
G6



$$AB = AD$$

Show that  $ABCD$  is a kite.

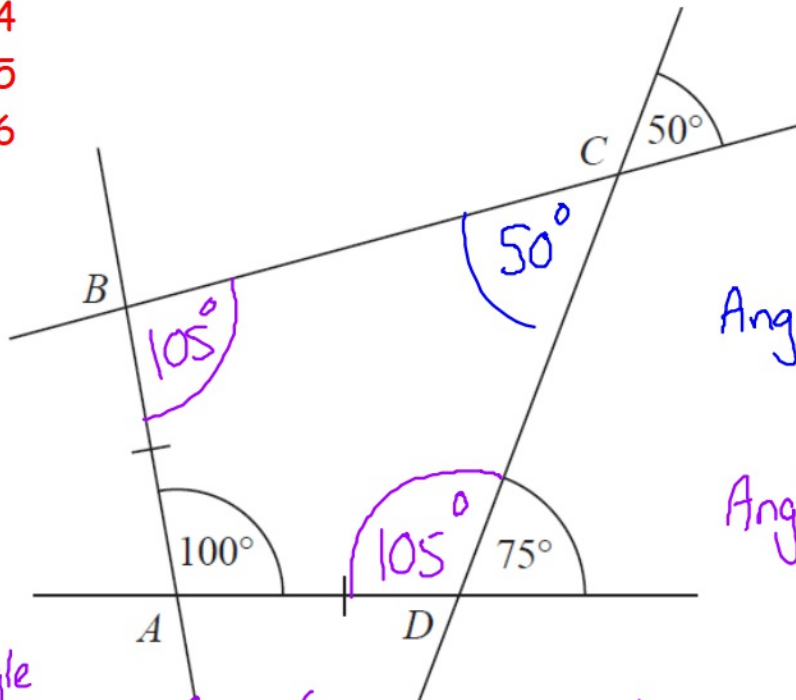
Give a reason for each stage of your working.

(Total for Question 14 is 4 marks)

14 The diagram shows quadrilateral  $ABCD$  with each of its sides extended.

Video Created by W Neill

G4  
G5  
G6



$AB = AD$

Show that  $ABCD$  is a kite.

Give a reason for each stage of your working.

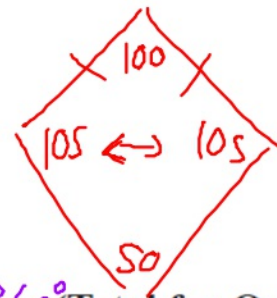
Angle  $BCD = 50^\circ$ , because vertically opposite angles are equal.

Angle  $ADC = 105^\circ$  as angles on a straight line add to  $180^\circ$

Angle  
 $ABC = 360^\circ - (100 + 105 + 50)$

$360 - 255$

$= 105^\circ$  ... angles in a quad add to  $360^\circ$  (Total for Question 14 is 4 marks)



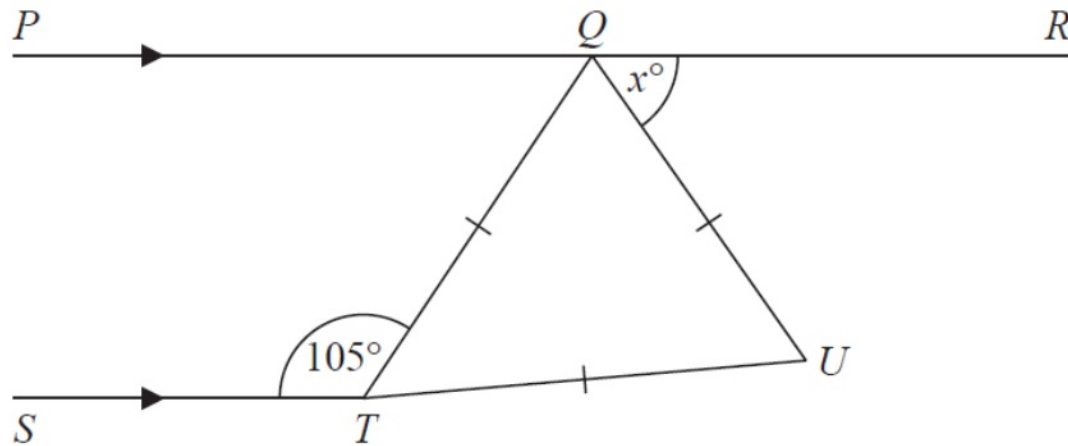
This is kite  
with opposite  
angles both  $105^\circ$  ✓



17

G5

G7



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

Angle  $STQ = 105^\circ$

Work out the value of  $x$ .

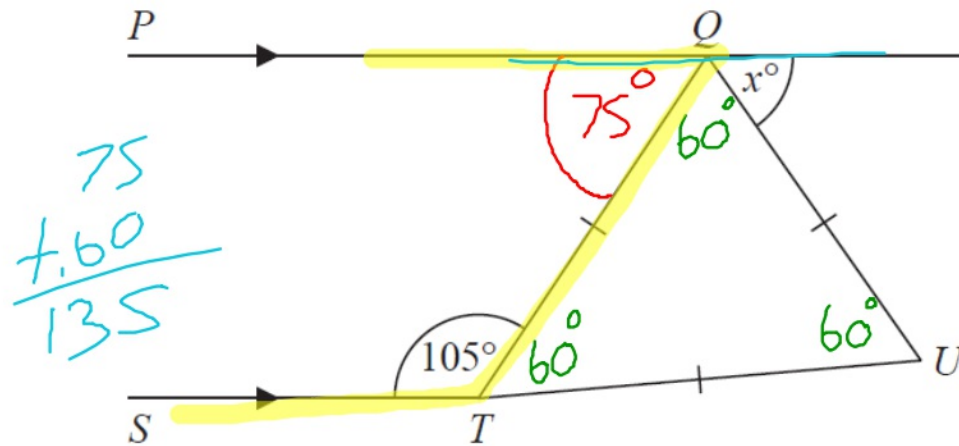
Give a reason for each stage of your working.

.....  
(Total for Question 17 is 4 marks)



17

G5  
G7



Equilateral triangle  
must have each angle  
at  $60^\circ$  ✓

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

Angle  $STQ = 105^\circ$

Work out the value of  $x$ .

Give a reason for each stage of your working.

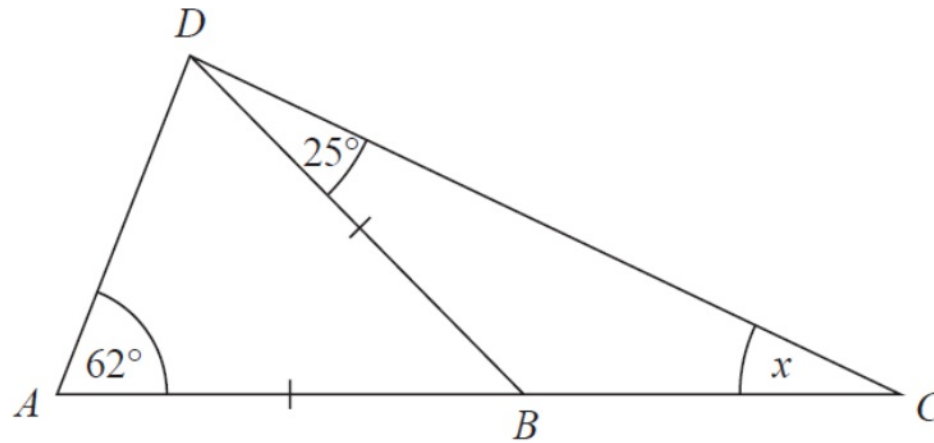
Angle  $PQT = 75^\circ$  as co-interior  
angles add  $180^\circ$

$x^\circ = 180^\circ - 135^\circ$   
Angles on a straight line  
add to  $180^\circ$  .....  $45^\circ$

**(Total for Question 17 is 4 marks)**

13

65



In the diagram,  $ABC$  is a straight line.

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

You must give a reason for each stage of your working.

.....  
o

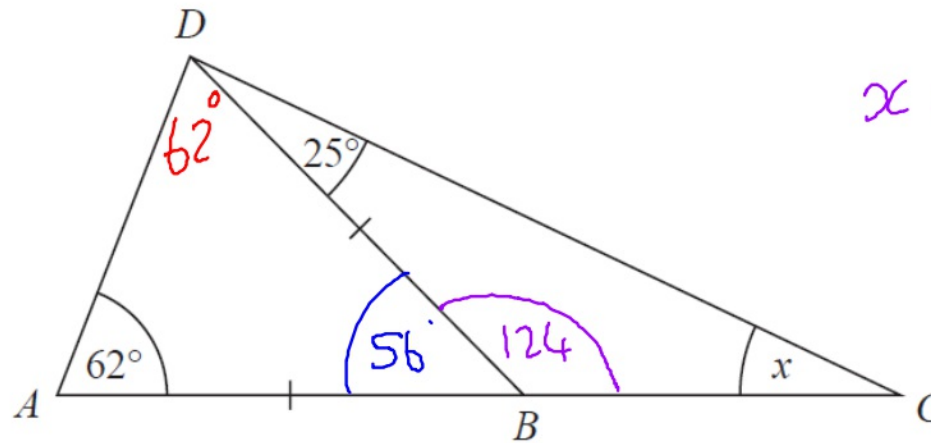
(Total for Question 13 is 4 marks)

13

G5

Video created by W Neill

$$\begin{array}{r} 62 \\ 62 \\ \hline 124 \end{array}$$



$$x = \begin{array}{r} 124 \\ + 25 \\ \hline 149 \end{array}$$

$180 - 149 = 31$   
 angles in a triangle add to  $180^\circ$

In the diagram,  $ABC$  is a straight line.

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

You must give a reason for each stage of your working.

angle  $CBD = 124^\circ$  as angles on a straight line add to  $180^\circ$

angle  $ADB$  as base angles in a triangle are equal.

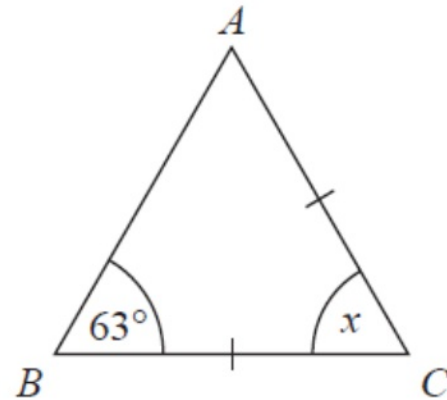
angle  $abd = 56^\circ$  as angles in a triangle add to  $180^\circ$

31°

(Total for Question 13 is 4 marks)

15 Mary needs to work out the size of angle  $x$  in this diagram.

Video created by W Neill



She writes

$x = 63^\circ$  because base angles of an isosceles triangle are equal.

Mary is wrong.

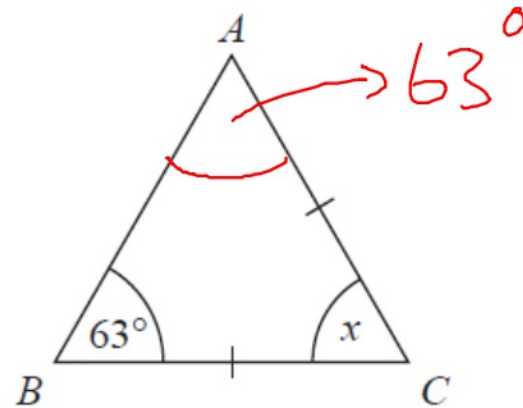
(a) Explain why.

GS

(1)

15 Mary needs to work out the size of angle  $x$  in this diagram.

Video created by W Neill



She writes

$x = 63^\circ$  because base angles of an isosceles triangle are equal.

Mary is wrong.

(a) Explain why.

GS

$x$  is not the base angle

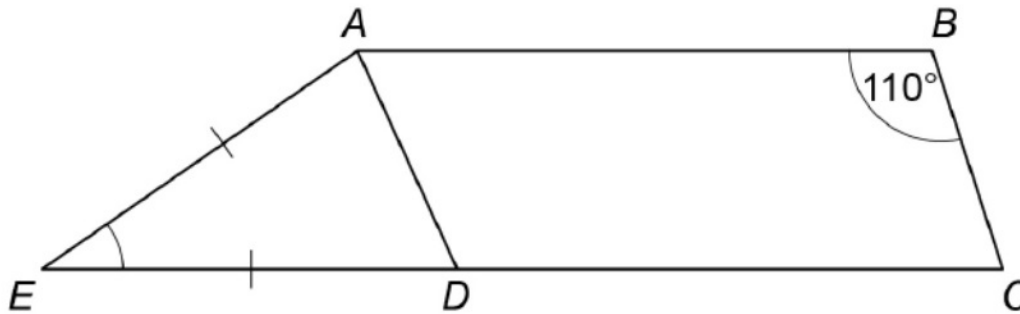
Angle BAC is other base angle

(1)

AQA

15 Trapezium  $ABCE$  is made from parallelogram  $ABCD$  and isosceles triangle  $ADE$ .  
 $AE = DE$

G4  
G5  
G6



Not drawn  
accurately

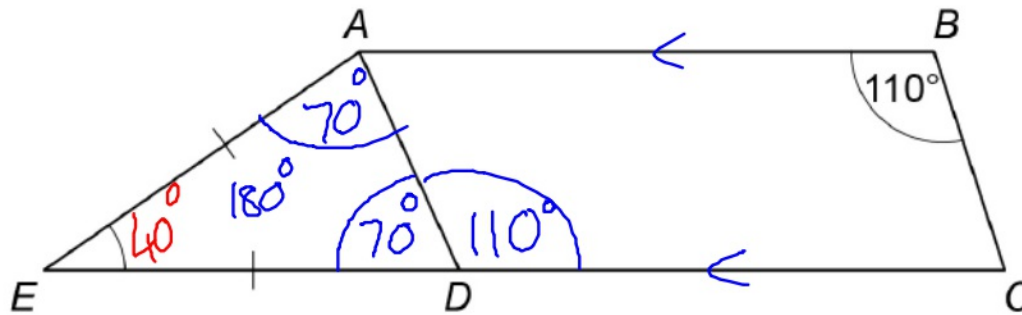
Work out the size of angle  $AED$ .

[3 marks]

Answer \_\_\_\_\_ degrees

15 Trapezium  $ABCE$  is made from parallelogram  $ABCD$  and isosceles triangle  $ADE$ .  
 $AE = DE$

G4  
G5  
G6



Not drawn accurately

Work out the size of angle  $AED$ .

[3 marks]

$$\begin{array}{r} 180^\circ \\ - 70 \\ - 70 \\ \hline 40^\circ \end{array}$$

Answer 40 degrees



10

One of the angles in a triangle is  $60^\circ$

Video created by W Neill

65

Tick a box for each statement.

	Must be true	Cannot be true	Might be true
The triangle is equilateral			
The triangle has at least one other acute angle			
The triangle is right-angled			
The other two angles are each less than $60^\circ$			

[4 marks]

10

One of the angles in a triangle is  $60^\circ$

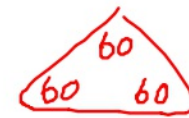
Video created by W Neill

G5

Tick a box for each statement.



	Must be true	Cannot be true	Might be true
The triangle is equilateral			✓
The triangle has at least one other acute angle	✓		
The triangle is right-angled			✓
The other two angles are each less than $60^\circ$		✓	



$60 + 90 + 90$   
more than  
 $180^\circ$

$60 + 59 + 59 = 178$  [4 marks]  
impossible

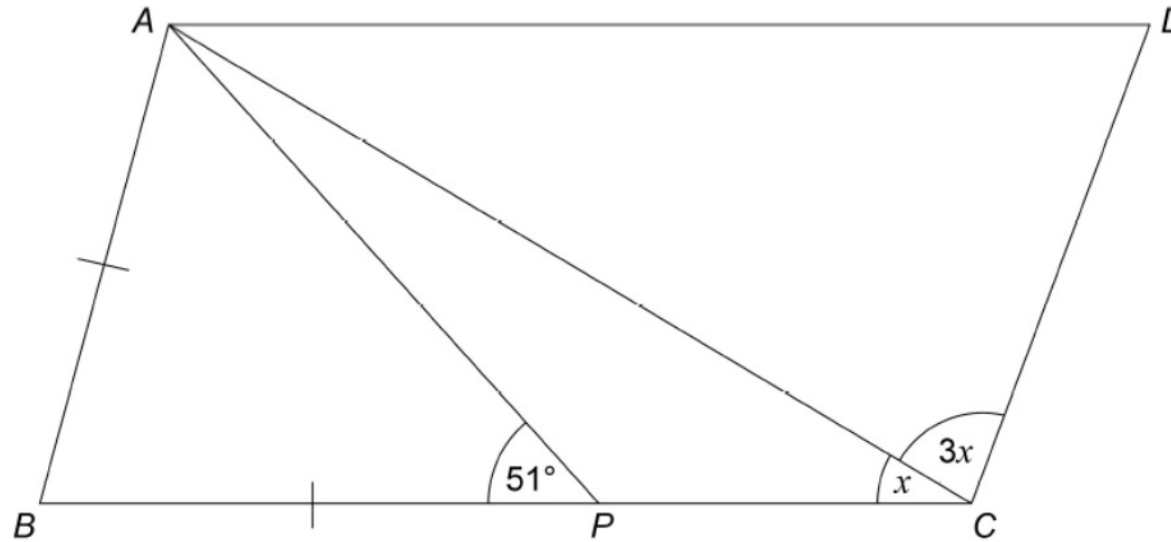
22

$ABCD$  is a parallelogram.

Video created by W Neill

$AB = BP$

A16  
G5  
G6



Work out the size of angle  $x$ . [4 marks]

Answer \_\_\_\_\_ degrees



16 (a)  $BCD$  is a straight line.

Triangle  $ABC$  is equilateral.

G4

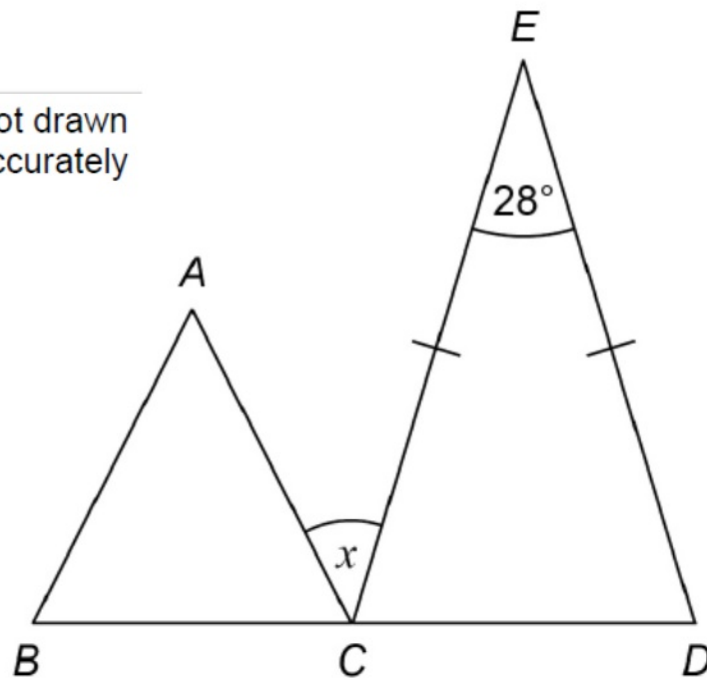
G5

$CE = DE$

Work out the size of angle  $x$ .

[4 marks]

Not drawn  
accurately



Answer \_\_\_\_\_ degrees

16 (a)  $BCD$  is a straight line.

Triangle  $ABC$  is equilateral.

G4

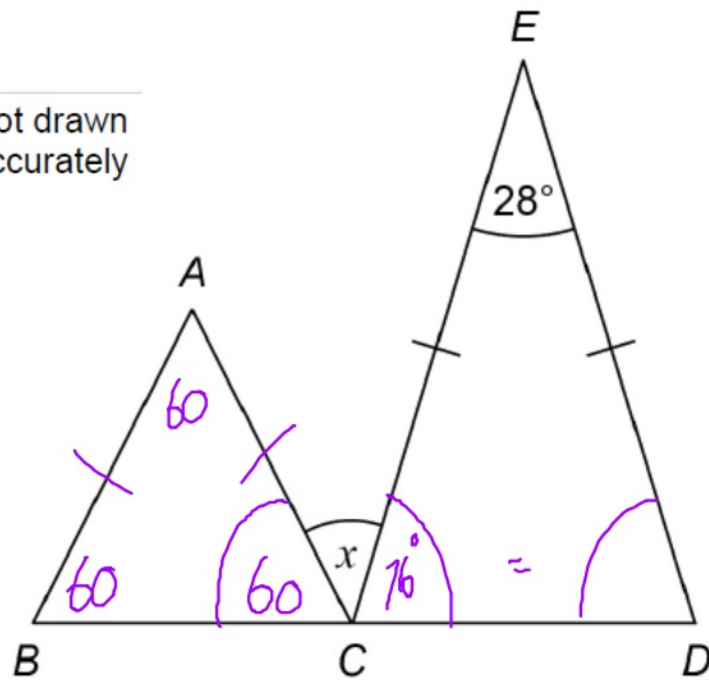
G5

$CE = DE$

Work out the size of angle  $x$ .

[4 marks]

Not drawn accurately



$$x^\circ = 180^\circ - 76^\circ - 60^\circ$$
$$=$$

Answer 44 degrees