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Mob: +974 55249797 / 55258711

E-mail: rashed.saba@gmail.com

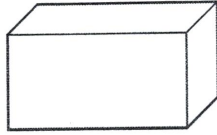
MATHEMATICS -CORE
TOPIC- Angles and shapes

11-J-13

For
Examiner's
Use

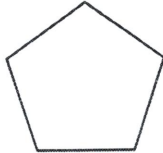
1. Complete each statement with the correct mathematical term.

(a)



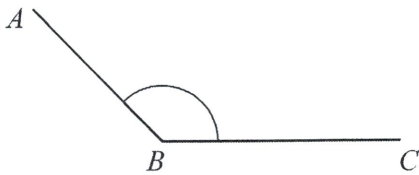
This solid is a [1]

(b)



This polygon is a regular [1]

(c)

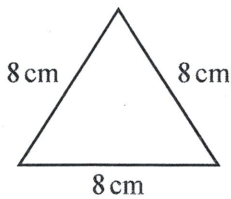


Angle ABC is an angle [1]

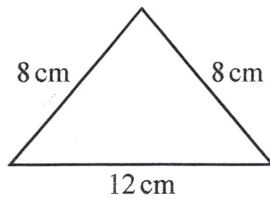
4

33-7-15

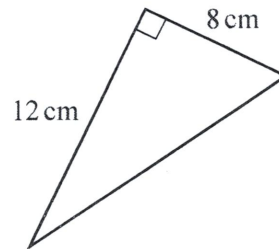
2 (a) Write the mathematical name under each of these triangles.



.....



.....



.....

NOT TO
SCALE

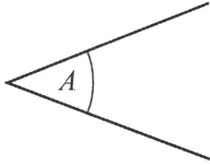
[3]



similar	acute	line	perpendicular	radius
reflex	obtuse	parallel	congruent	isosceles

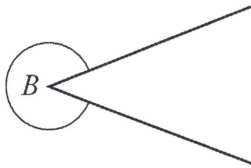
Choose the correct word from this box to complete each of these statements.

(a)



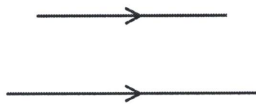
Angle *A* is [1]

(b)



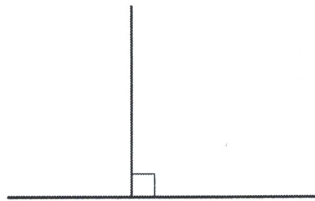
Angle *B* is [1]

(c)



These lines are [1]

(d)

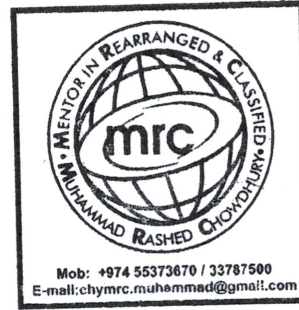


These lines are [1]



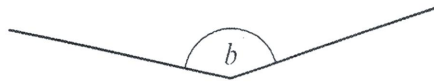
0 4

- (a) Draw an acute angle.
Label the acute angle with the letter *a*.



- (b) Write down the mathematical name of angle *b*.

[1]



Answer(b) [1]

0 5

11-7-15

equilateral triangle	square
regular pentagon	parallelogram
regular hexagon	circle

From the list write down

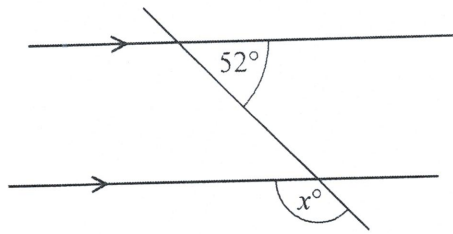
- (a) the shape which has more than 6 lines of symmetry,

Answer(a) [1]

- (b) the shape which has both acute and obtuse interior angles.

Answer(b) [1]

06



NOT TO SCALE

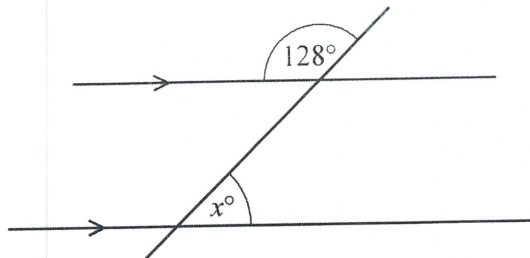
In the diagram, a straight line intersects two parallel lines.

Find the value of x .

Answer $x = \dots\dots\dots$ [1]

07 (a)

12-J-13



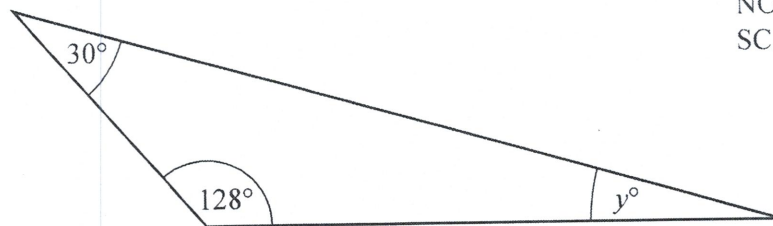
NOT TO SCALE

A straight line intersects two parallel lines as shown.

Find the value of x .

Answer(a) $x = \dots\dots\dots$ [2]

(b)



NOT TO SCALE

Calculate the value of y .

Answer(b) $y = \dots\dots\dots$ [1]

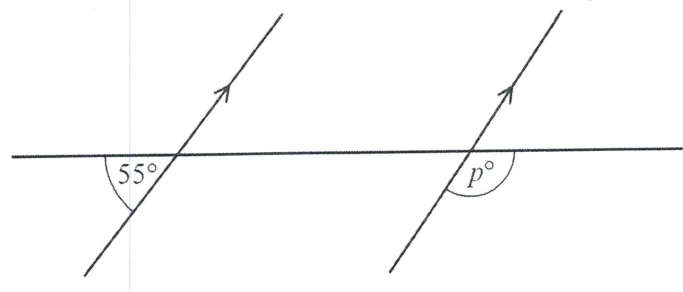
For Examiner's Use



11-13

For
Examiner's
Use

08



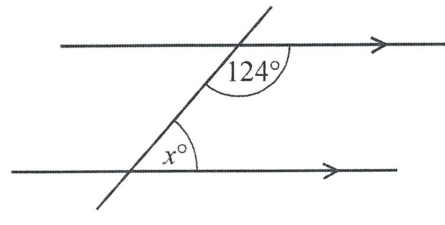
NOT TO
SCALE

Find the value of p .

Answer $p = \dots\dots\dots$ [2]

13-7-15

09



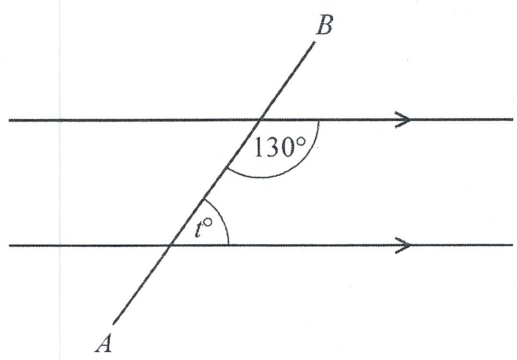
NOT TO
SCALE

Find the value of x .

Answer $x = \dots\dots\dots$ [1]

10

5



The straight line AB crosses two parallel lines.

Find the value of t .



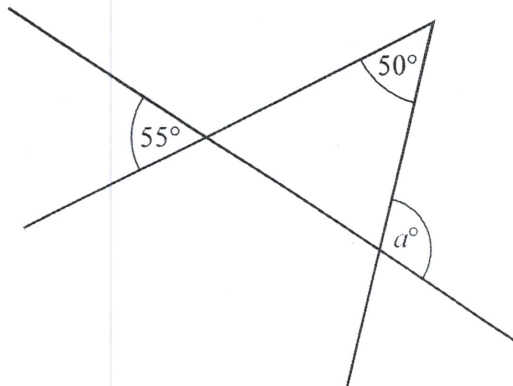
For
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Use

Answer(d) $t = \dots\dots\dots$ [1]

11-3-13

For
Examiner's
Use

11



NOT TO
SCALE

Use the information in the diagram to find the value of a .

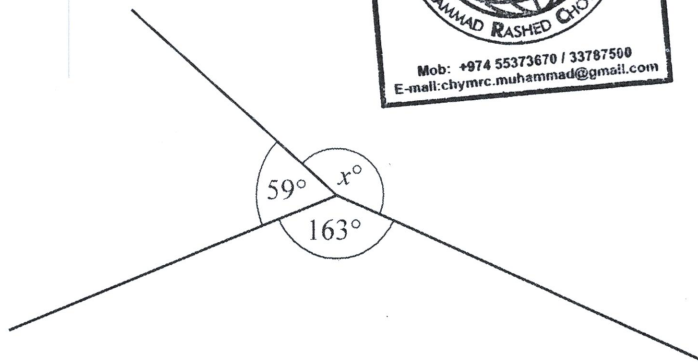
Answer $a = \dots\dots\dots$ [2]

12



11-3-14

NOT TO
SCALE



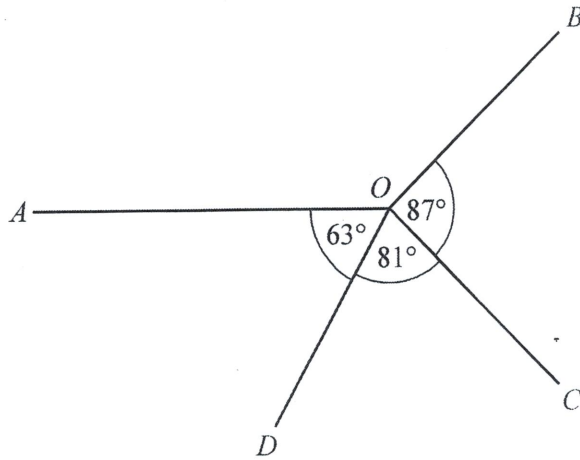
(a) Find the value of x .

Answer(a) $x = \dots\dots\dots$ [1]

(b) One of the angles is 163° .

What type of angle is this?

Answer(b) $\dots\dots\dots$ [1]



NOT TO SCALE



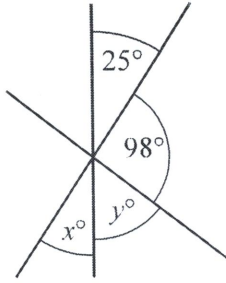
(a) Calculate the size of angle AOB .

Answer(a) Angle AOB = [1]

(b) What type of angle is angle AOB ?

Answer(b) [1]

(a)



NOT TO SCALE



The diagram shows three straight lines crossing at a point.

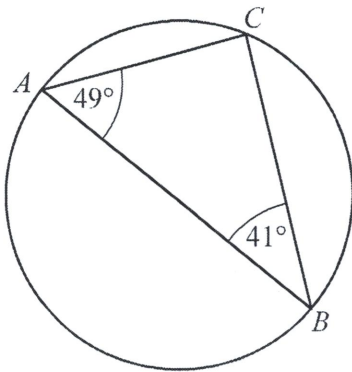
(i) Find the value of x .

$x = \dots\dots\dots [1]$

(ii) Work out the value of y .

$y = \dots\dots\dots [1]$

(b)

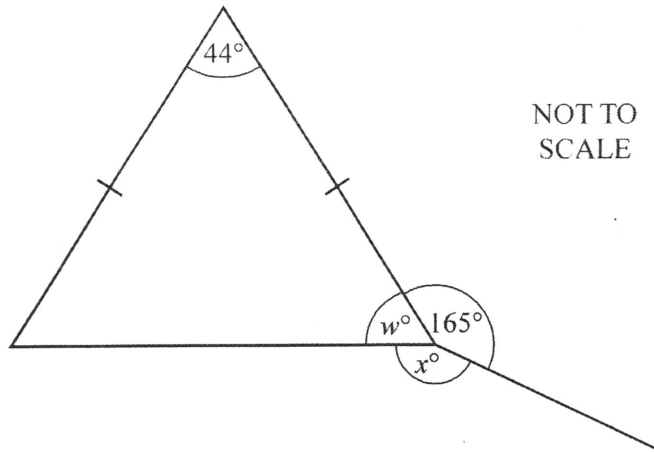


NOT TO SCALE

A , B and C are points on the circumference of a circle.

Explain why AB must be a diameter of the circle.

.....
 [2]



(i) Write down the mathematical name for this triangle.

Answer(c)(i)..... [1]

(ii) Find the value of w .

Answer(c)(ii) $w =$ [1]

(iii) Find the value of x .

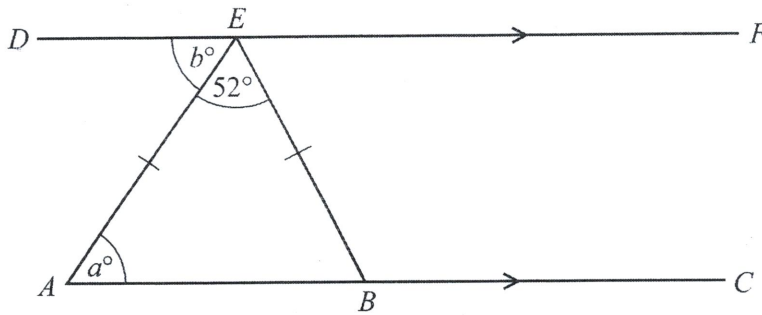
Answer(c)(iii) $x =$ [1]



13-7-12

For
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16



NOT TO
SCALE

In the diagram lines AC and DF are parallel and $AE = EB$.
Angle $AEB = 52^\circ$.

(a) Write down the mathematical name for triangle AEB .

Answer(a) [1]

(b) Work out the value of a .

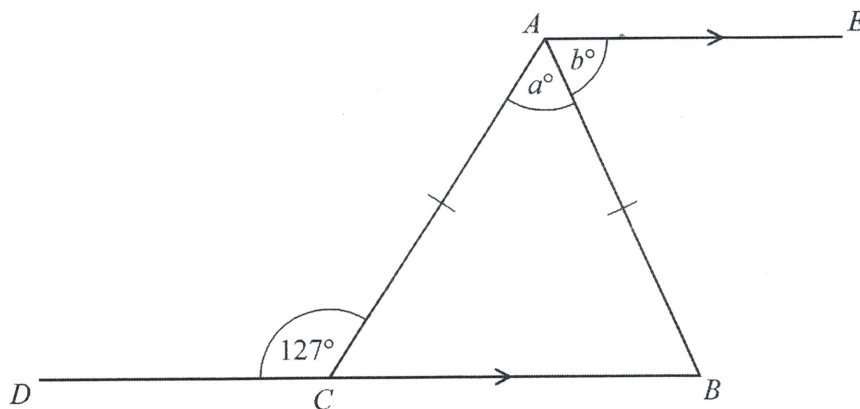
Answer(b) $a =$ [1]

(c) Explain why $a = b$.

Answer(c) [1]

17

11-7-14



NOT TO
SCALE

The diagram shows an isosceles triangle ABC .
 DCB is a straight line and is parallel to AE .
Angle $DCA = 127^\circ$.

Find the value of

(a) a ,

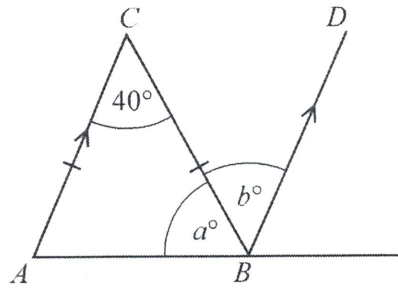
Answer(a) $a =$ [2]

(b) b .

Answer(b) $b =$ [1]

18

11-7-16



NOT TO SCALE



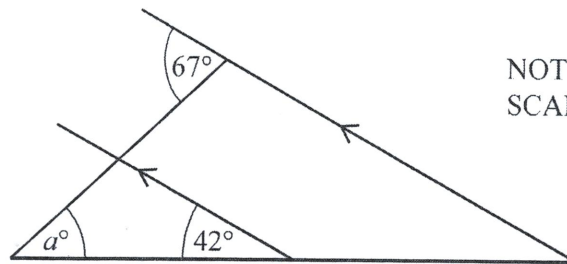
Triangle ABC is isosceles and AC is parallel to BD .

Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$ [2]

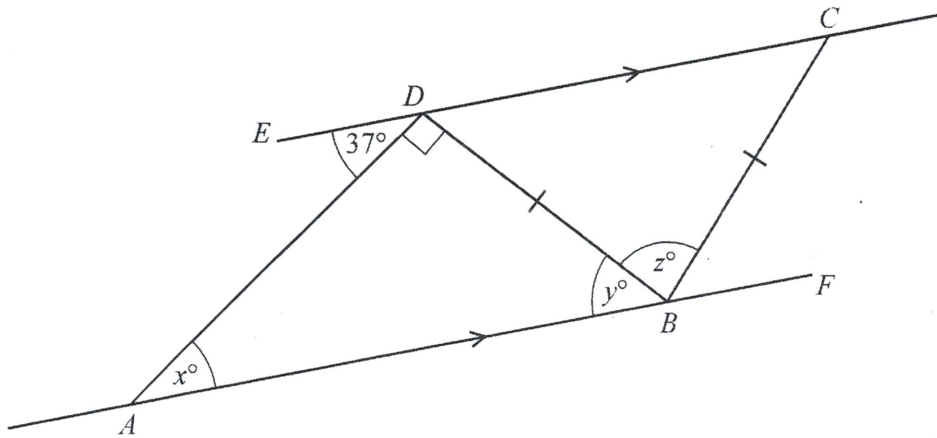
19



NOT TO SCALE

Find the value of a .

$a = \dots\dots\dots$ [2]



NOT TO SCALE

In the diagram, ABF is parallel to EDC .
 Angle $EDA = 37^\circ$, angle ADB is a right angle and $BC = BD$.

Find the value of

(a) x ,

Answer(a) $x = \dots\dots\dots [1]$

(b) y ,

Answer(b) $y = \dots\dots\dots [1]$

(c) z .

Answer(c) $z = \dots\dots\dots [2]$



21

(a) Complete this statement.

To be obtuse, an angle must be between degrees and degrees.

[1]

(b)

parallelogram	square	rectangle
kite	trapezium	rhombus

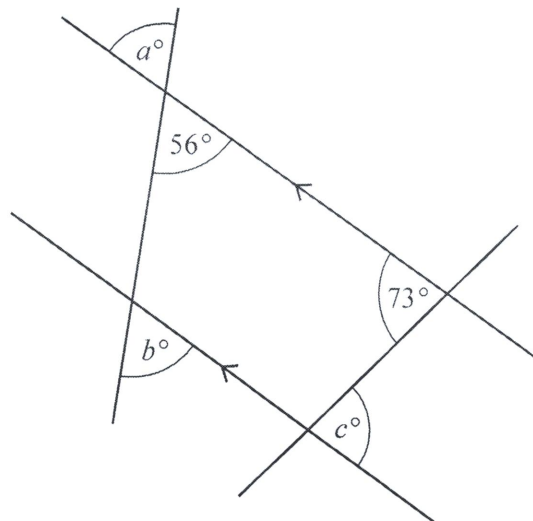
Choose one word from the box to complete each statement.

A has no lines of symmetry but has rotational symmetry of order 2.

A has two lines of symmetry but no right angles.

A has one line of symmetry but no rotational symmetry. [3]

(c)



NOT TO SCALE



The diagram shows four straight lines.

Write down the values of a , b and c .

Give a geometrical reason for each answer.

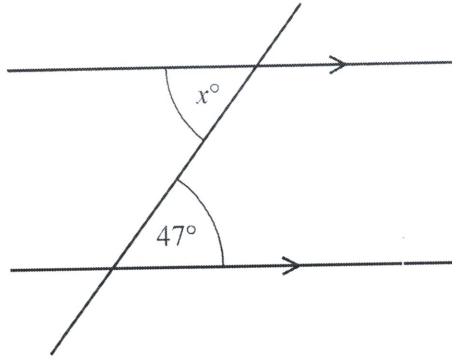
$a = \dots\dots\dots$ because $\dots\dots\dots$

$b = \dots\dots\dots$ because $\dots\dots\dots$

$c = \dots\dots\dots$ because $\dots\dots\dots$ [6]

22

(a)



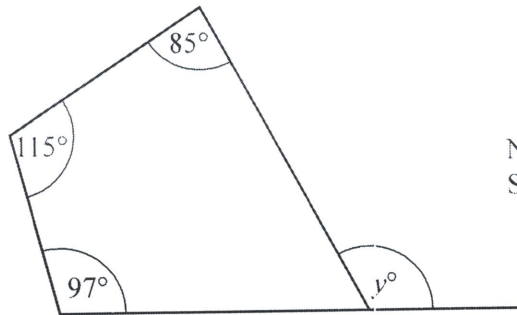
NOT TO SCALE



Find the value of x .

$x = \dots\dots\dots$ [1]

(b)



NOT TO SCALE

Find the value of y .

$y = \dots\dots\dots$ [2]

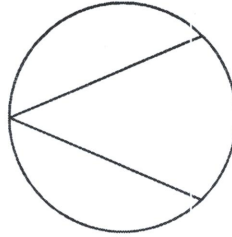
23

Without using your calculator, work out $1\frac{7}{12} + \frac{13}{20}$.

You must show all your working and give your answer as a mixed number in its simplest form.

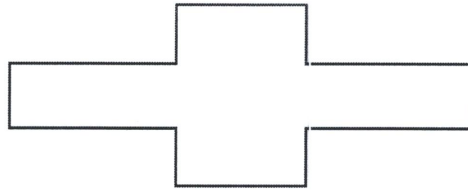
$\dots\dots\dots$ [3]

(a) Draw the line of symmetry on the shape below.



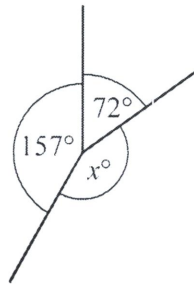
[1]

(b) Write down the order of rotational symmetry of the shape below.



Answer(b) [1]

(c) (i)

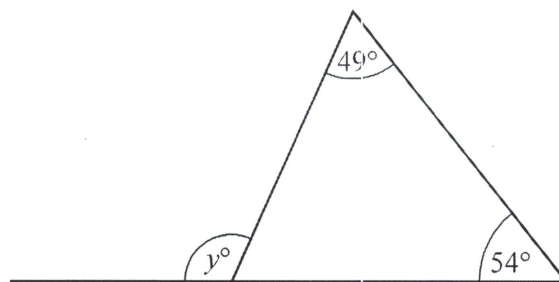


NOT TO SCALE

Work out the value of x .

Answer(c)(i) $x =$ [1]

(ii)



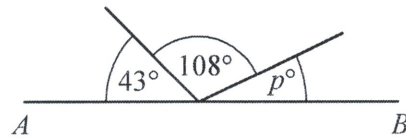
NOT TO SCALE

Work out the value of y .

Answer(c)(ii) $y =$ [2]

2 b

(a)



NOT TO SCALE



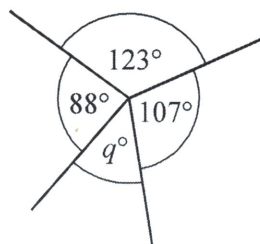
For Examiner's Use

AB is a straight line.

Find the value of p .

Answer(a) $p = \dots\dots\dots$ [1]

(b)

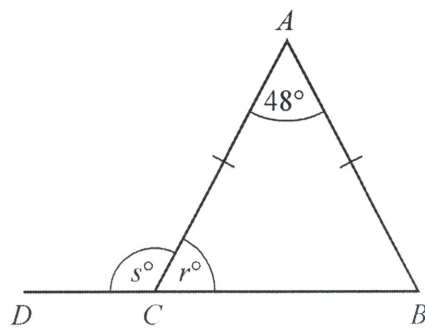


NOT TO SCALE

Find the value of q .

Answer(b) $q = \dots\dots\dots$ [1]

(c)



NOT TO SCALE

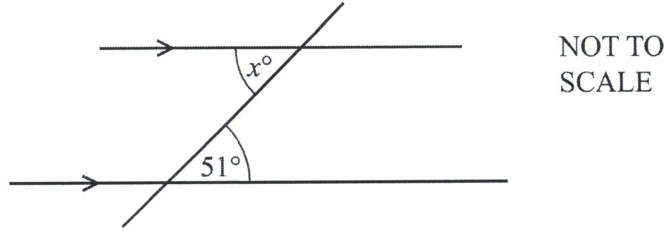
DCB is a straight line and $AB = AC$.

Find the values of r and s .

Answer(c) $r = \dots\dots\dots$

$s = \dots\dots\dots$ [2]

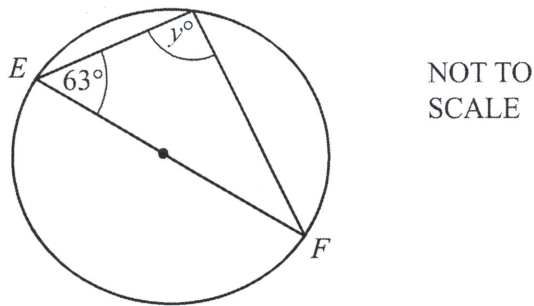
(a) Find the value of x .



Answer(a) $x =$ [1]

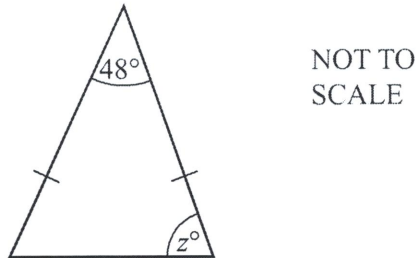
(b) EF is a diameter of the circle.

Find the value of y .



Answer(b) $y =$ [1]

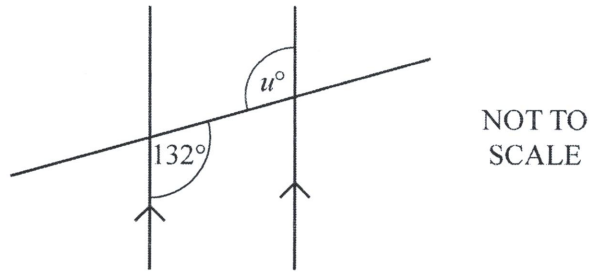
(c) Find the value of z in this isosceles triangle.



Answer(c) $z =$ [1]



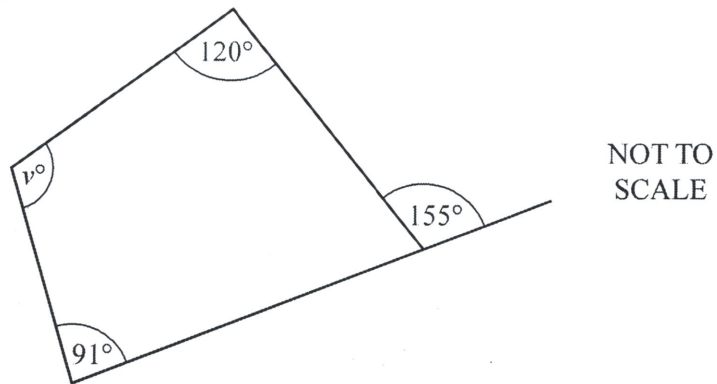
21 (a)



Find the value of u .

Answer(a) $u = \dots\dots\dots$ [1]

(b)

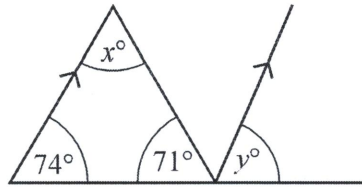


Find the value of v .

Answer(b) $v = \dots\dots\dots$ [2]



28 (a)



NOT TO SCALE



Work out the value of

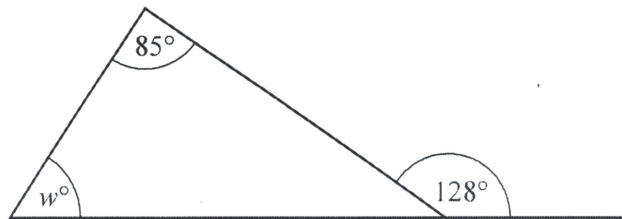
(i) x ,

$x = \dots\dots\dots [1]$

(ii) y .

$y = \dots\dots\dots [1]$

(b)



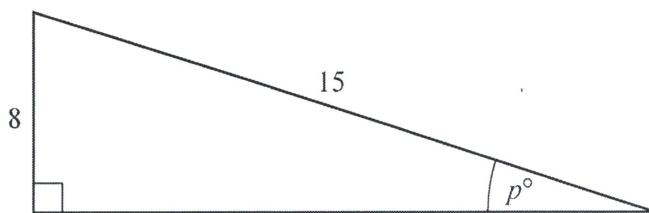
NOT TO SCALE

Work out the value of w .
Give reasons for your answer.

$w = \dots\dots\dots$ because $\dots\dots\dots$

$\dots\dots\dots [3]$

(c)

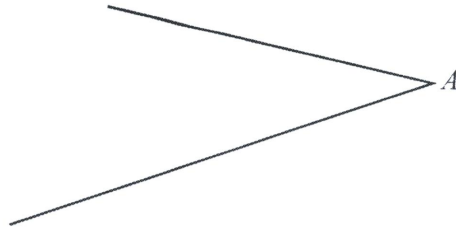


NOT TO SCALE

Use trigonometry to calculate the value of p .

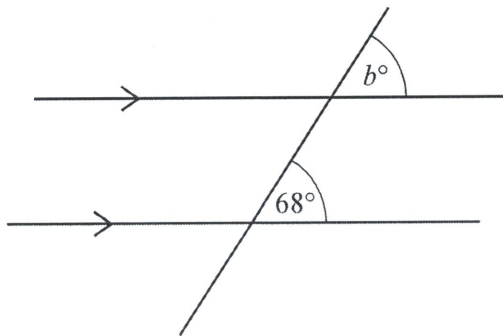
$p = \dots\dots\dots [2]$

29 (a) Measure the reflex angle at A .



..... [1]

(b)

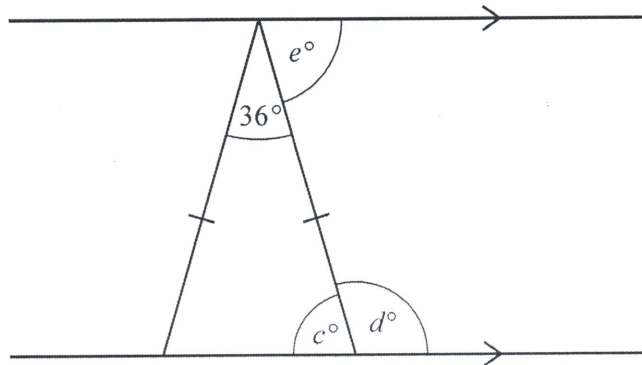


NOT TO SCALE

Find the value of b .
Give a reason for your answer.

$b =$ because [2]

(c)



NOT TO SCALE

Find the values of c , d and e .

$c =$

$d =$

$e =$ [3]

- (d) A regular polygon has 24 sides.

Work out the size of one of the interior angles of the polygon.

..... [3]

- (e) Town Y is 6.7 km from town X.
The bearing of town Y from town X is 113°.

On the scale drawing, draw a line from X and mark the position of Y.
The scale is 1 centimetre represents 1 kilometre.



Scale: 1 cm to 1 km



[2]

- (f) Give the correct mathematical name for each of the shapes described below.

- (i) I am a quadrilateral.
I have two pairs of parallel sides but no right angles.
I have two lines of symmetry.

..... [1]

- (ii) I am a quadrilateral.
I have one pair of opposite angles that are equal.
I have one line of symmetry.

..... [1]

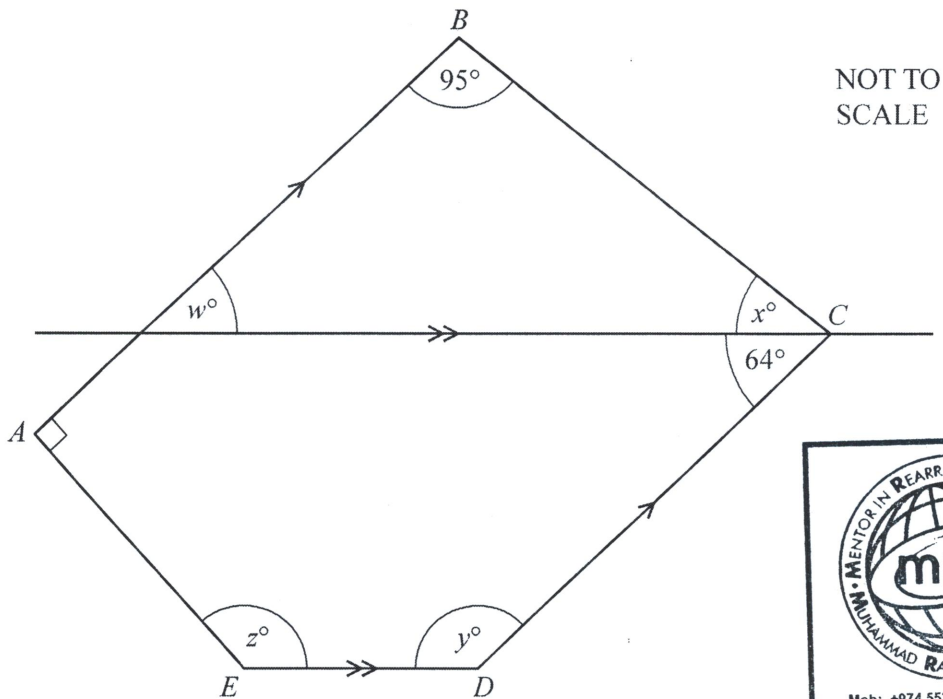
(iv) The quadrilateral forms the cross section of a prism with length 6.8 cm.

Calculate the volume of the prism.

Give your answer correct to 2 significant figures.

Answer(a)(iv) cm³ [2]

3 0



The diagram shows a pentagon, $ABCDE$.

AB is parallel to DC .

A straight line, parallel to ED , passes through the vertex C .

(i) Find the values of w , x and y .

Answer(b)(i) $w =$

$x =$

$y =$ [3]

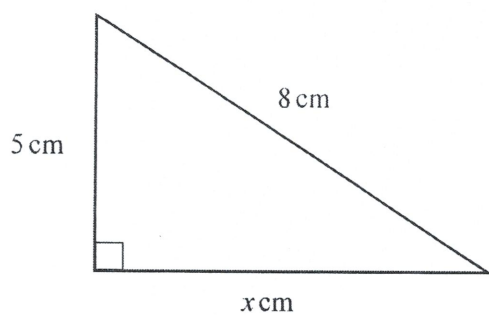
(ii) The sum of the angles of a pentagon is 540° .

Find the value of z .

Answer(b)(ii) $z =$ [2]

3 1

12-N-15



NOT TO SCALE

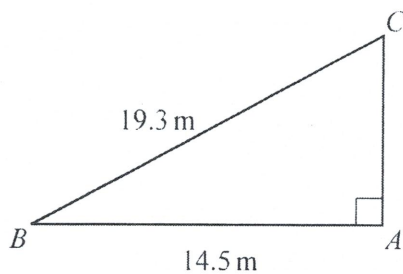


Calculate the value of x .

Answer $x = \dots\dots\dots$ [3]

12-N-15

3 2



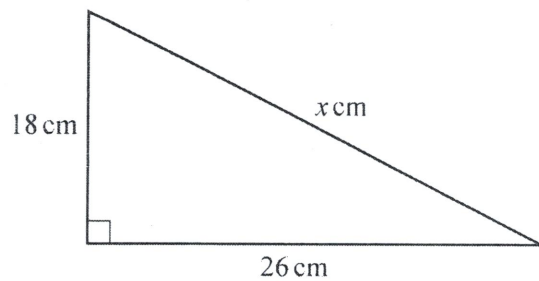
NOT TO SCALE

Use trigonometry to calculate angle ACB .

Answer Angle $ACB = \dots\dots\dots$ [2]

13-n-15

3 3



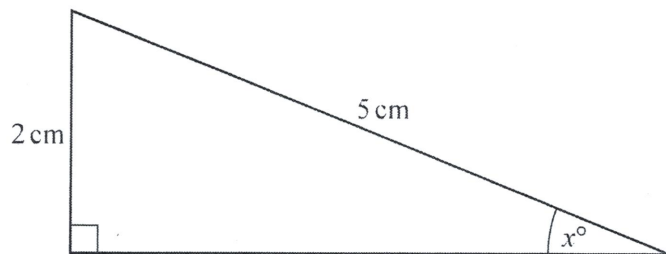
NOT TO SCALE

Calculate the value of x .

Answer $x =$ [2]

3 4

13-n-15



NOT TO SCALE

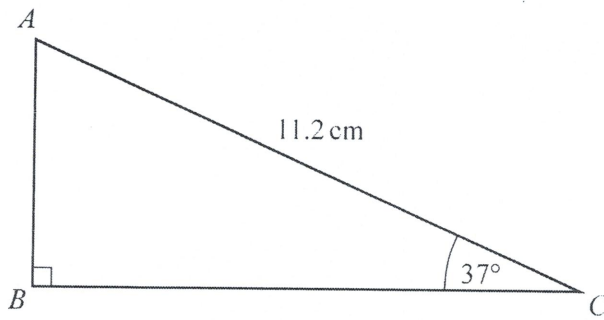
Calculate the value of x .

Answer $x =$ [2]



11-7-15

35



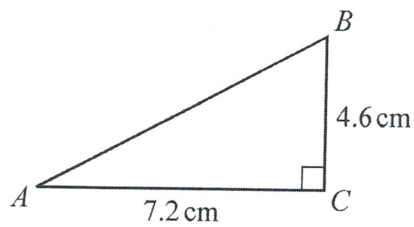
NOT TO SCALE

Calculate AB.



Answer AB = cm [2]

36



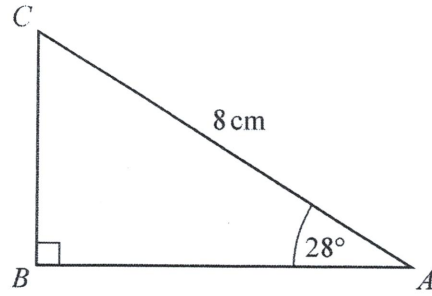
NOT TO SCALE

Calculate AB.

Answer cm [2]

12-7-14

37

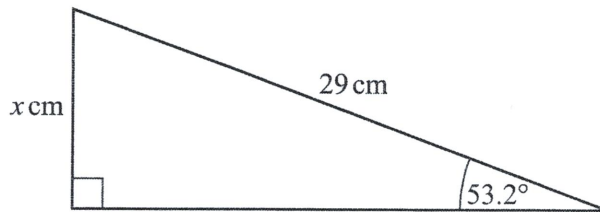


NOT TO SCALE

Calculate the length of AB.

Answer AB = cm [2]

38



NOT TO SCALE

Calculate the value of x.

Answer x = [2]

11-7-12

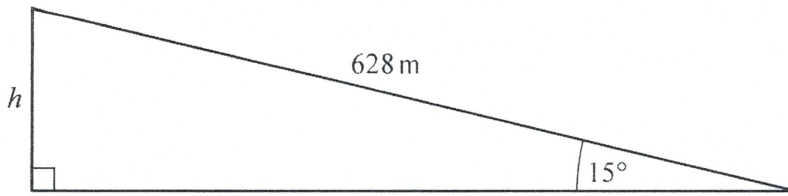
inner's Use



39

13-N-13

For
Examiner's
Use



NOT TO
SCALE

Calculate the length h .
Give your answer correct to 2 significant figures.

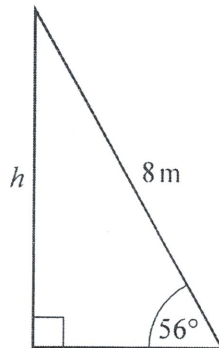
Answer $h = \dots\dots\dots$ m [3]

40

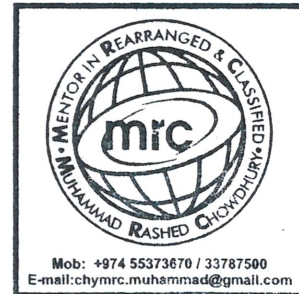
11-N-13

For
Examiner's
Use

The diagram shows a ladder of length 8 m leaning against a vertical wall.



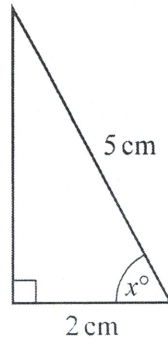
NOT TO
SCALE



Use trigonometry to calculate h .
Give your answer correct to 2 significant figures.

Answer $h = \dots\dots\dots$ m [3]

41



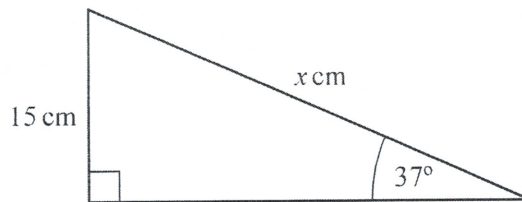
NOT TO SCALE

Calculate the value of x .

Answer $x = \dots\dots\dots$ [2]

Handwritten mark

42



NOT TO SCALE

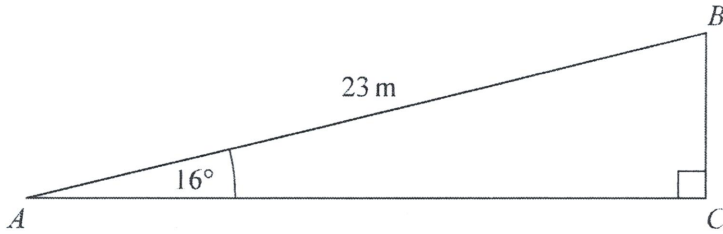
Using trigonometry, calculate the value of x .

$x = \dots\dots\dots$ [3]



13-7 16

43



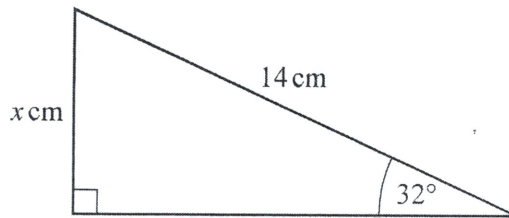
NOT TO SCALE

A ramp, AB , with length 23 m, slopes up at an angle of 16° to the horizontal, AC .

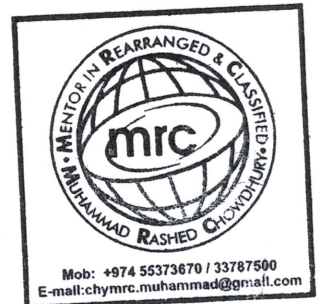
Use trigonometry to calculate AC .

$AC = \dots\dots\dots$ m [2]

44



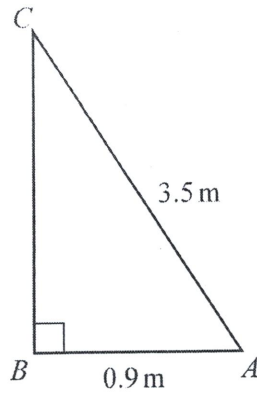
NOT TO SCALE



Use trigonometry to calculate the value of x .

$x = \dots\dots\dots$ [2]

45



NOT TO SCALE



Calculate angle BAC .

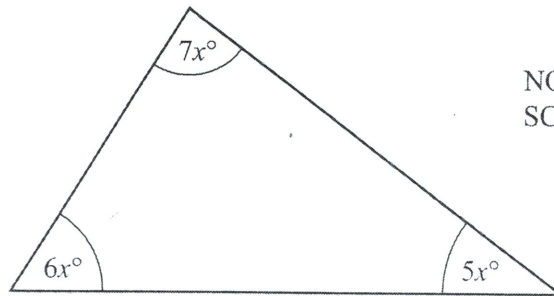
Angle $BAC = \dots\dots\dots$ [2]

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0580/12/F/M/16

[Turn over

46 The three angles in a triangle are $5x^\circ$, $6x^\circ$ and $7x^\circ$.



NOT TO SCALE

(a) Find the value of x .

$x = \dots\dots\dots$ [2]

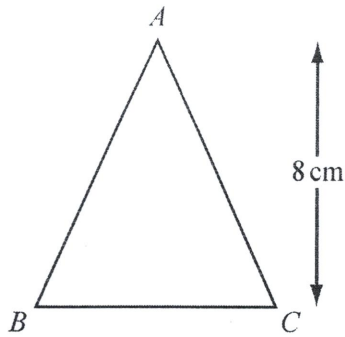
(b) Work out the size of the largest angle in the triangle.

$\dots\dots\dots$ [1]

47

12-1-13

For
Examiner's
Use



NOT TO
SCALE

Triangle ABC has a height of 8 cm and an area of 42 cm^2 .

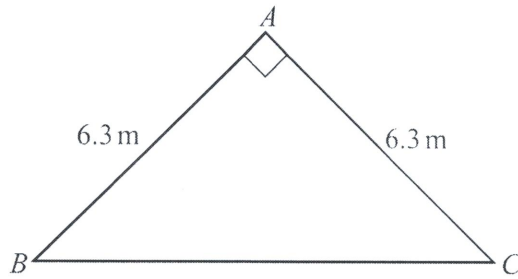
Calculate the length of BC .

Answer $BC = \dots\dots\dots \text{ cm}$ [2]



48 (a)

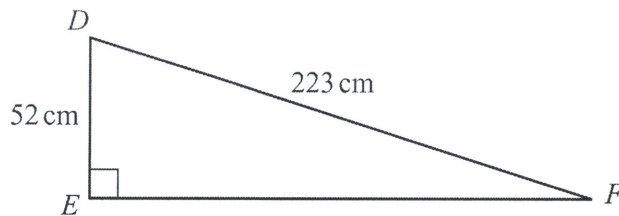
713-17



NOT TO SCALE

Calculate the length BC .

(b)



$BC = \dots\dots\dots$ m [2]

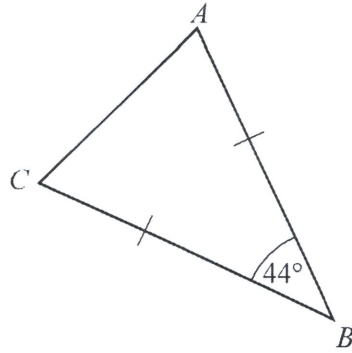
NOT TO SCALE

Calculate angle DFE .

Angle $DFE = \dots\dots\dots$ [2]



4.9 (a)



NOT TO
SCALE

Triangle ABC is an isosceles triangle with $AB = CB$.
Angle $ABC = 44^\circ$.

Find angle ACB .

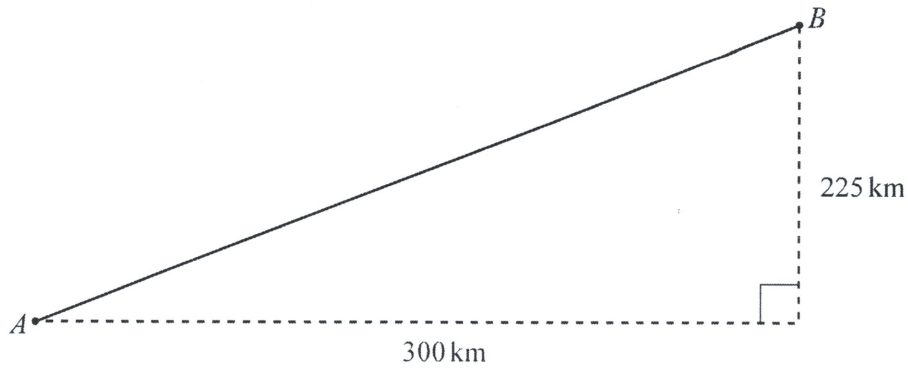
Angle $ACB = \dots\dots\dots$ [1]

(b) A regular polygon has an exterior angle of 40° .

Work out the number of sides of this polygon.

$\dots\dots\dots$ [2]





NOT TO
SCALE

The diagram shows the path of a plane from airport A to airport B .

- (i) Show that the distance between A and B is 375 km.

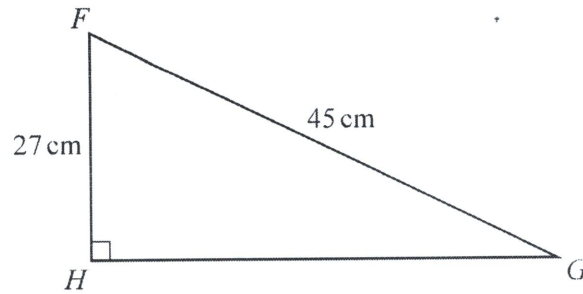


[2]

- (ii) The plane flies at an average speed of 450 km/h.
It leaves A at 14 45 and flies directly to B .

Work out the time it arrives at B .

..... [4]



NOT TO
SCALE



FGH is a right-angled triangle.

Calculate

(i) GH ,

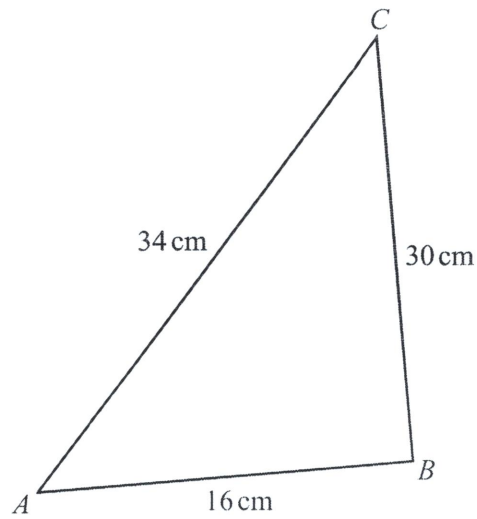
Answer(c)(i) $GH = \dots\dots\dots$ cm [3]

(ii) the perimeter of the triangle.

Answer(c)(ii) $\dots\dots\dots$ cm [1]

(iii) the area of the triangle.

Answer(c)(iii) $\dots\dots\dots$ cm^2 [2]

NOT TO
SCALE

- (a) Write down all your working to show that angle ABC is a right angle.

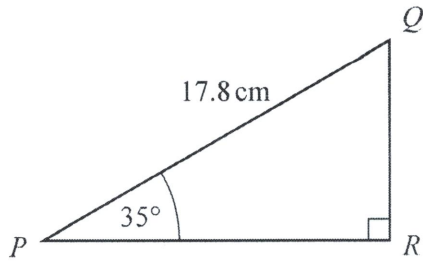
Answer(a)

[2]

- (b) Use trigonometry to calculate angle CAB .

Answer(b) Angle $CAB =$ [2]

(c)



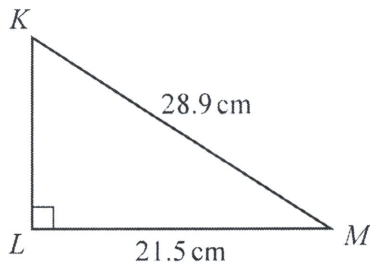
NOT TO
SCALE

PQR is a right-angled triangle.

Use trigonometry to calculate PR .

$PR = \dots\dots\dots$ cm [2]

(d)



NOT TO
SCALE

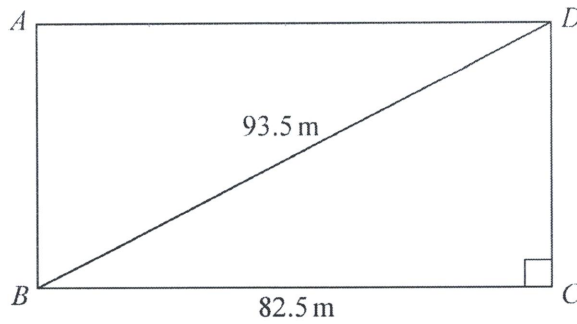
KLM is a right-angled triangle.

Calculate KL .

$KL = \dots\dots\dots$ cm [3]



53



NOT TO
SCALE

The diagram shows a rectangular field, $ABCD$, with a straight path, BD .

- (a) Calculate the distance from C to D .

..... m [3]

- (b) Yan walks along the edge of the field from B to C and then from C to D .
Lee walks along the straight path BD .

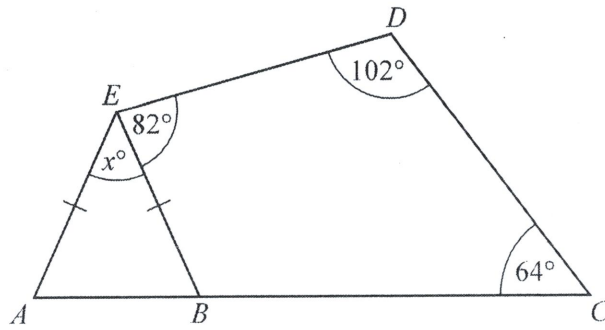
Work out how much further Yan walks than Lee.

..... m [1]



13-J-15

54



NOT TO SCALE



The diagram shows an isosceles triangle ABE and a quadrilateral $BCDE$. ABC is a straight line.

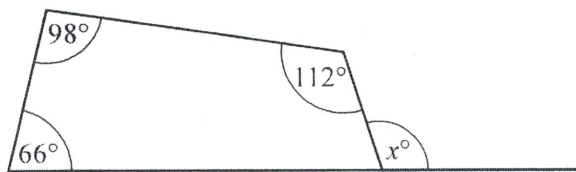
Calculate the value of x .

Answer $x = \dots\dots\dots$ [3]

55

(a) The diagram shows a quadrilateral with one side extended.

13-a-15



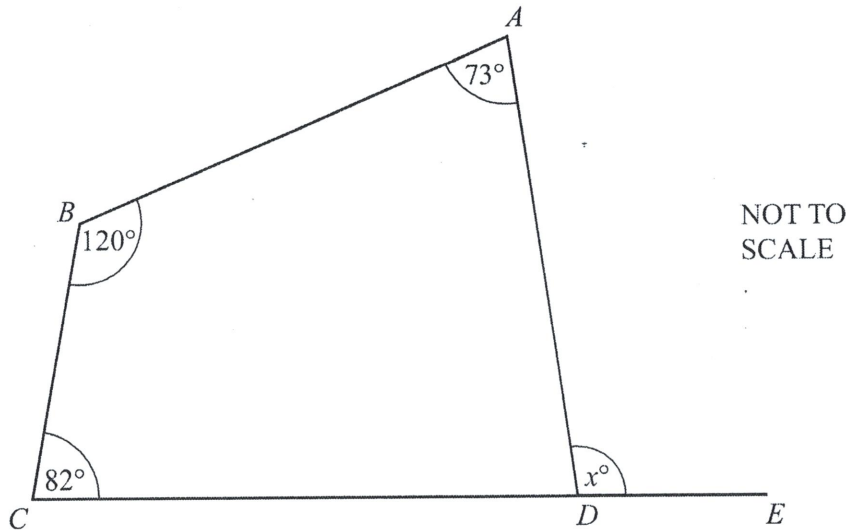
NOT TO SCALE

Find the value of x .

Answer(a) $x = \dots\dots\dots$ [2]

(b) Find the sum of the interior angles of a 25-sided polygon.

Answer(b) $\dots\dots\dots$ [2]



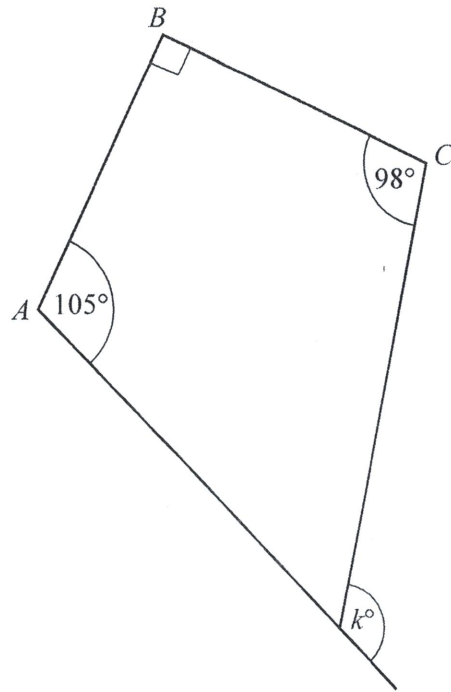
The diagram shows a quadrilateral $ABCD$.
 CDE is a straight line.

Calculate the value of x .

Answer $x =$ [2]



57



NOT TO
SCALE

In the diagram, all four lines are straight.
Angle $A = 105^\circ$, angle $B = 90^\circ$ and angle $C = 98^\circ$.

Find the value of k .

Answer $k = \dots\dots\dots$ [2]



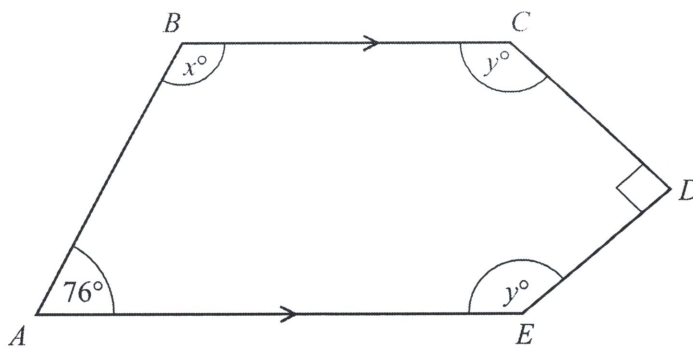
- (a) Show that the sum of the interior angles of a regular pentagon is 540° .

Answer(a)



[2]

- (b)



NOT TO
SCALE

The diagram shows a pentagon $ABCDE$.
 BC is parallel to AE and angle CDE is a right angle.

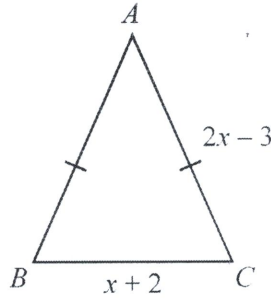
Find the values of x and y .

Answer(b) $x =$

$y =$ [3]

In this question all lengths are in centimetres.

ABC is an isosceles triangle.
 $AC = 2x - 3$ and $BC = x + 2$.



NOT TO SCALE



(a) Write down an expression for AB .

Answer(a) $AB = \dots\dots\dots$ [1]

(b) Write down and simplify an expression for the perimeter of the triangle.

Answer(b) $\dots\dots\dots$ cm [2]

(c) A rectangle has length $3(x - 4)$ and width $(14 - x)$.

(i) Write down and simplify an expression for the perimeter of this rectangle.

Answer(c)(i) $\dots\dots\dots$ cm [2]

(ii) The triangle and the rectangle have the same perimeter.

Write down an equation and use it to find x .

Answer(c)(ii) $x = \dots\dots\dots$ [2]

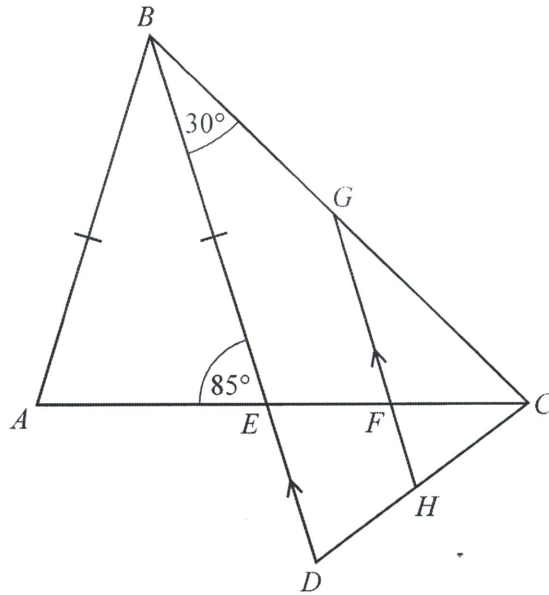
(d) Find the length and width of the rectangle.

Answer(d) Length = $\dots\dots\dots$ cm

Width = $\dots\dots\dots$ cm [2]

(e) Work out the area of the rectangle.

Answer(e) $\dots\dots\dots$ cm^2 [1]



NOT TO SCALE



In the diagram, ABC and DEC are triangles.
 $AB = BE$ and BE is parallel to GF .
 Angle $AEB = 85^\circ$ and angle $CBE = 30^\circ$.

(i) Find angle EAB .

Answer(a)(i) Angle $EAB = \dots\dots\dots$ [1]

(ii) Find angle ABE .

Answer(a)(ii) Angle $ABE = \dots\dots\dots$ [1]

(iii) Find reflex angle ABC .

Answer(a)(iii) Angle $ABC = \dots\dots\dots$ [1]

(iv) Find angle BEC .

Answer(a)(iv) Angle $BEC = \dots\dots\dots$ [1]

(v) Find angle EFH .

Answer(a)(v) Angle $EFH = \dots\dots\dots$ [1]

(vi) Find angle BCE .

Answer(a)(vi) Angle $BCE = \dots\dots\dots$ [1]

(vii) Complete the following statement.

Triangle is similar to triangle [1]

(b) For a regular 12-sided polygon, find the size of

(i) an exterior angle,

Answer(b)(i) [2]

(ii) an interior angle.

Answer(b)(ii) [1]





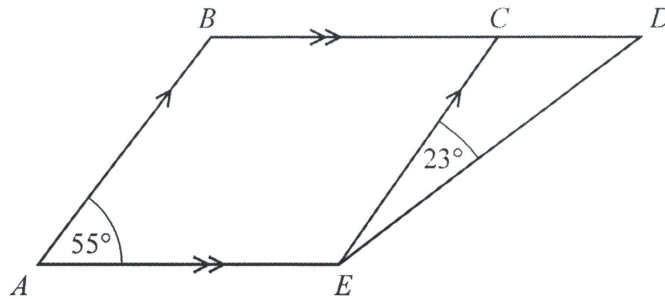
For
Examiner's
Use

6 1 (a) Complete the table.

Name of polygon	Number of sides
Quadrilateral	4
Heptagon	
	5

[2]

(b)



NOT TO
SCALE

In the diagram, AB is parallel to EC and BCD is parallel to AE .
Angle $BAE = 55^\circ$ and angle $CED = 23^\circ$.

(i) Complete the following statement.

The mathematical name for quadrilateral $ABDE$ is [1]

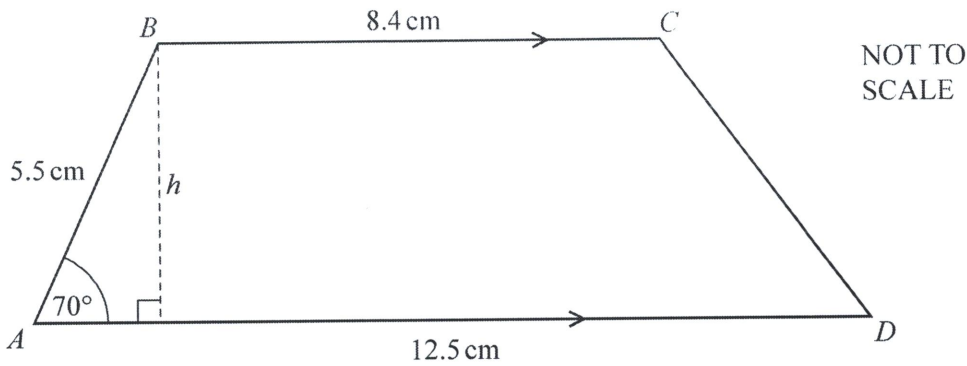
(ii) Work out the size of angle ABC .

Answer(b)(ii) Angle $ABC =$ [1]

(iii) Work out the size of angle CDE .

Answer(b)(iii) Angle $CDE =$ [2]

6 2 (a)



For
Examiner's
Use

In the quadrilateral $ABCD$, BC is parallel to AD .
 $AB = 5.5$ cm, $BC = 8.4$ cm, $AD = 12.5$ cm and angle $BAD = 70^\circ$.
 The height of the quadrilateral is h .

(i) Write down the mathematical name of the quadrilateral $ABCD$.

Answer(a)(i) [1]

(ii) Use trigonometry to show that $h = 5.2$ cm, correct to 1 decimal place.

Answer(a)(ii)

[2]

(iii) Calculate the area of the quadrilateral $ABCD$.

Answer(a)(iii) cm^2 [2]



63

11-5-12

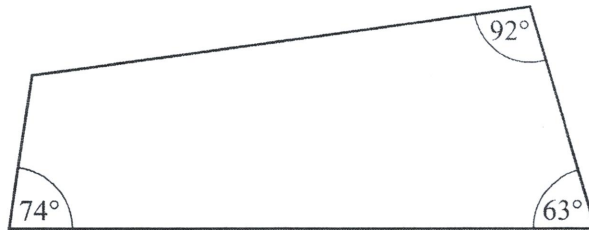
(a) A quadrilateral has four sides of equal length and two pairs of equal angles.

Write down the mathematical name for this quadrilateral.

For
Examiner's
Use

Answer(a) [1]

(b)



NOT TO
SCALE

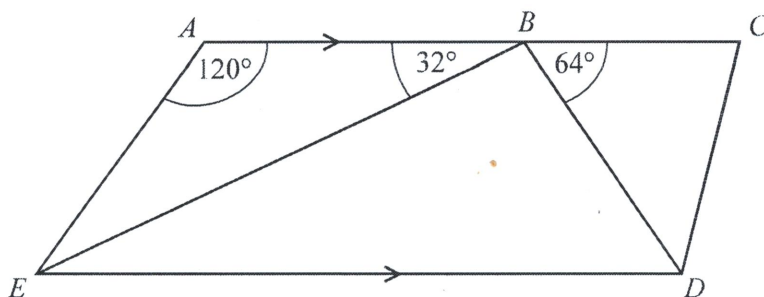
Three of the angles in a quadrilateral are 63° , 74° and 92° .

Work out the size of the fourth angle.

Answer(b) [1]



6 4



NOT TO SCALE

The diagram shows quadrilateral $ACDE$.
 AC is parallel to ED and B is a point on AC .
 Angle $EAB = 120^\circ$, angle $ABE = 32^\circ$ and angle $CBD = 64^\circ$.

(a) Work out angle EBD .

Answer(a) Angle $EBD = \dots\dots\dots$ [1]

(b) Work out angle AEB .

Answer(b) Angle $AEB = \dots\dots\dots$ [1]

(c) Complete this statement.

Angle $BED =$ angle ABE because they are $\dots\dots\dots$ angles. [1]

6 5 Work out the size of one interior angle of a regular 15-sided polygon.

Answer $\dots\dots\dots$ [3]

