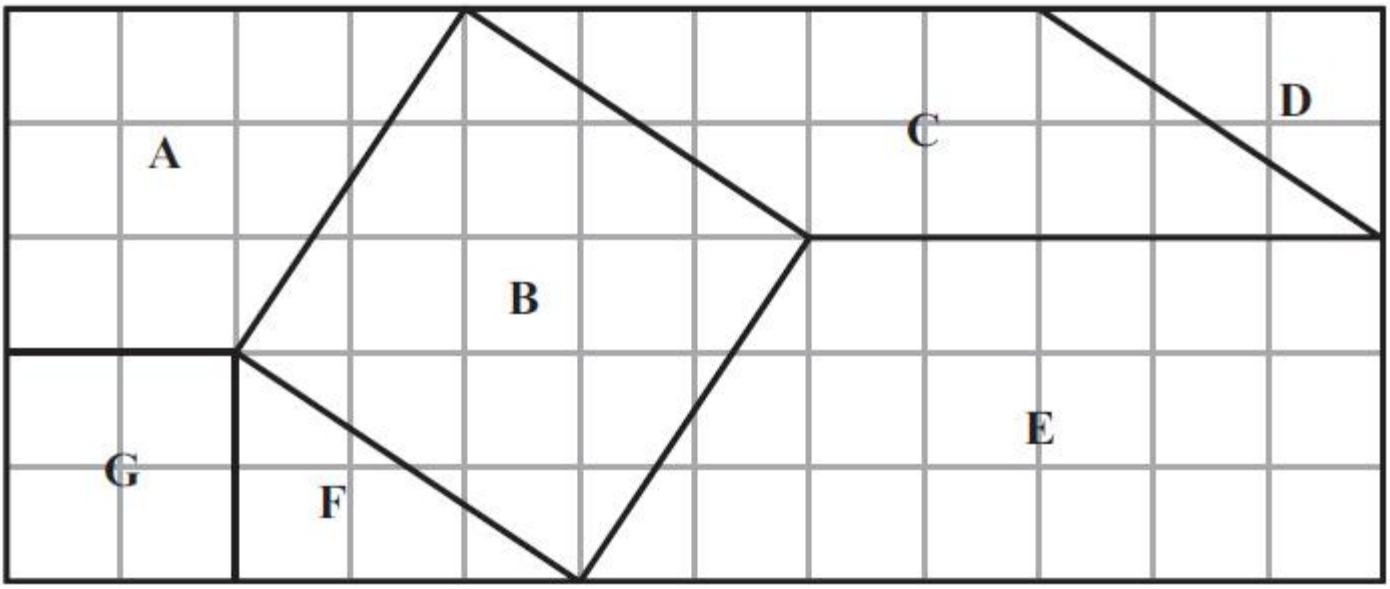
Unit 2 Revision Sheet D Polygons Congruency Symmetry Bearings Constructions Foundation & Higher

Questions

Q1.

The diagram shows 7 shapes, **A**, **B**, **C**, **D**, **E**, **F** and **G**, on a centimetre square grid.



(a) What is the mathematical name of shape **E**?

(1)

(b) Write down the letters of the two shapes which are congruent.

(1)

(c) Mark an obtuse angle on one of the shapes.
Label your angle *x*.

(1)

(d) How many lines of symmetry has shape **B**?

(1)

(e) Work out the area of shape **C**.

(2)

(Total for question = 6 marks)

Q2.

Write your answers in the spaces provided.

You must write down all the stages in your working.

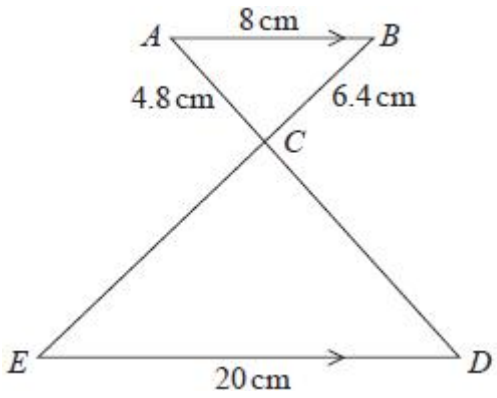


Diagram **NOT** accurately drawn

AB is parallel to *ED*.
ACD and *BCE* are straight lines.

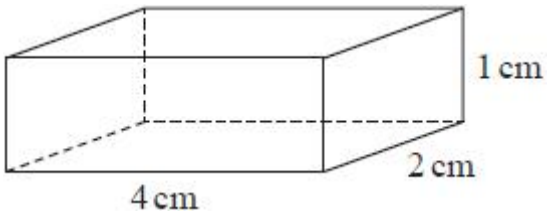
AB = 8 cm
AC = 4.8 cm
BC = 6.4 cm
ED = 20 cm

Work out the length of *BE*.

(Total for question = 3 marks)

Q3.

(a) Write down the mathematical name of this 3-D shape.



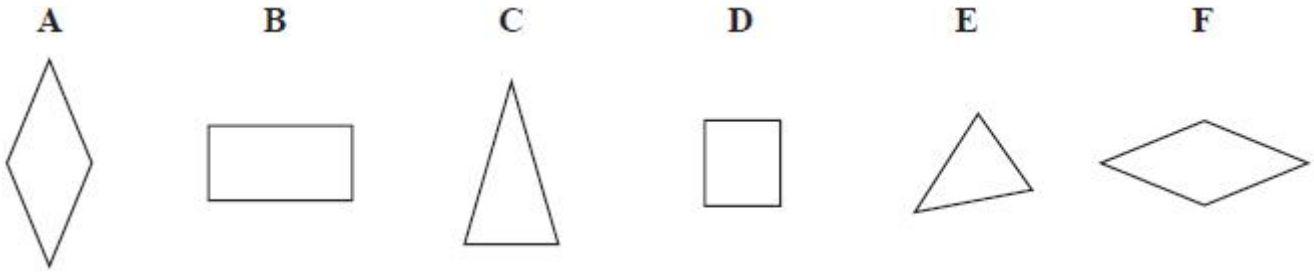
(1)

(b)

Measure the length of *AB*.

(1)

Here are six shapes.



Two of these shapes are congruent.

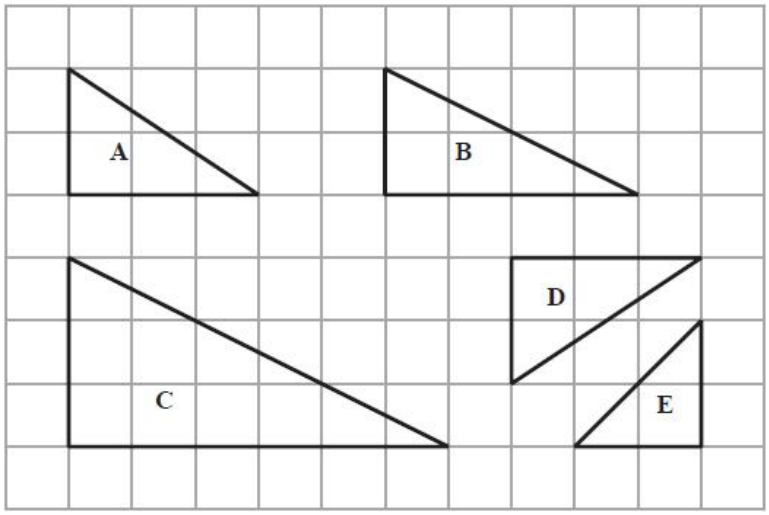
(c) Write down the letters of these two shapes.

(1)

(Total for question = 3 marks)

Q4.

Here are five triangles drawn on a square grid.



(a) Write down the letters of the two triangles that are congruent.

(1)

One of the triangles is similar to triangle **B**.

(b) Write down the letter of this triangle.

(1)

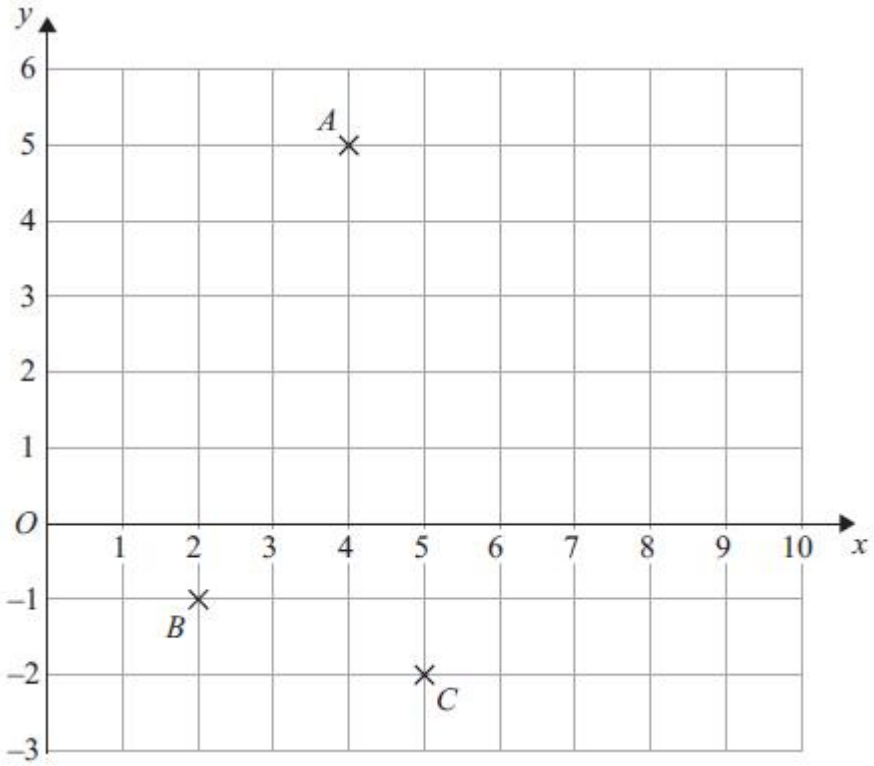
(c) Write down the letter of the triangle that has one line of symmetry.

(1)

(Total for question = 3 marks)

Q5.

The diagram shows three points, *A*, *B* and *C*, on a centimetre grid.



(a) Write down the coordinates of
(i) *A*,
(ii) *B*.

(2)

(b) (i) On the diagram, mark with a cross (×) the point D so that *ABCD* is a rectangle.
Label your point *D*.

(ii) On the diagram, draw rectangle *ABCD*.

(2)

(c) Write down the order of rotational symmetry of rectangle *ABCD*.

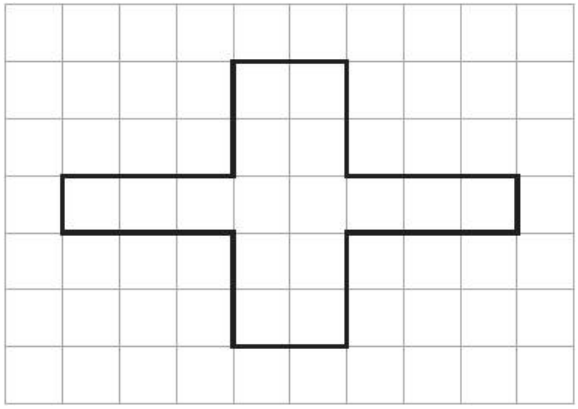
(1)

(d) Find the coordinates of the midpoint of *AB*.

(2)

(Total for question = 7 marks)

Q6.
The diagram shows a shape on a centimetre grid.



(a) Find the area of the shape.

(1)

(b) Find the perimeter of the shape.

(1)

(c) Write down the order of rotational symmetry of the shape.

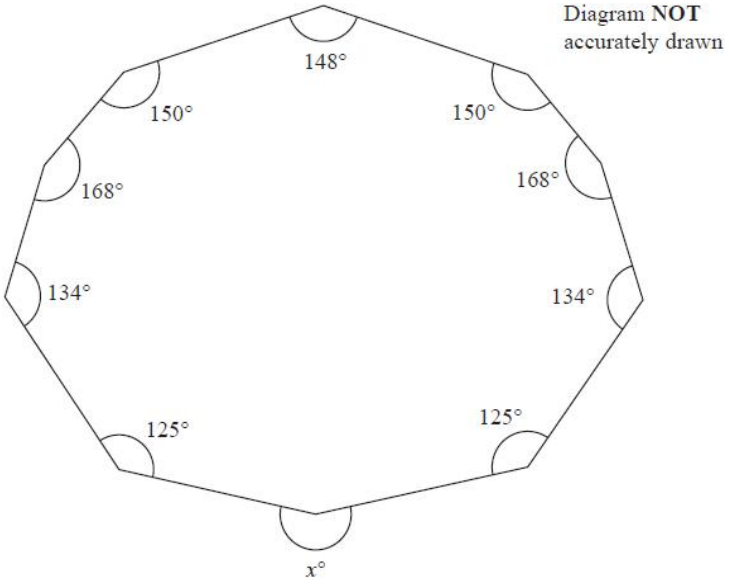
(1)

(d) On the shape, draw all the lines of symmetry.

(2)

(Total for question = 5 marks)

Q7.
Here is a 10-sided polygon.



Work out the value of x.

(Total for question = 4 marks)

Q8.

The diagram shows a square *ABCD* and a regular pentagon *CDEFG*.

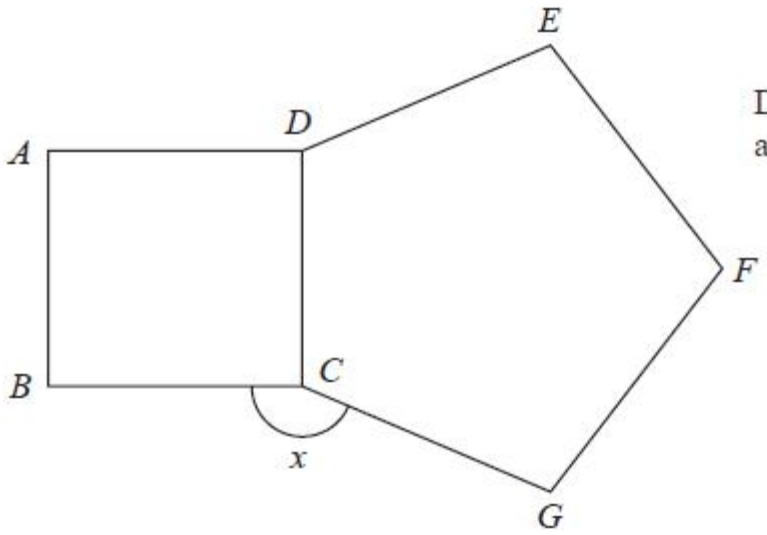


Diagram **NOT** accurately drawn

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

(Total for question = 3 marks)

Q9.

A regular polygon has *n* sides.
The size of each interior angle of the regular polygon is 140°

Work out the value of *n*.

(Total for question = 3 marks)

Q10.

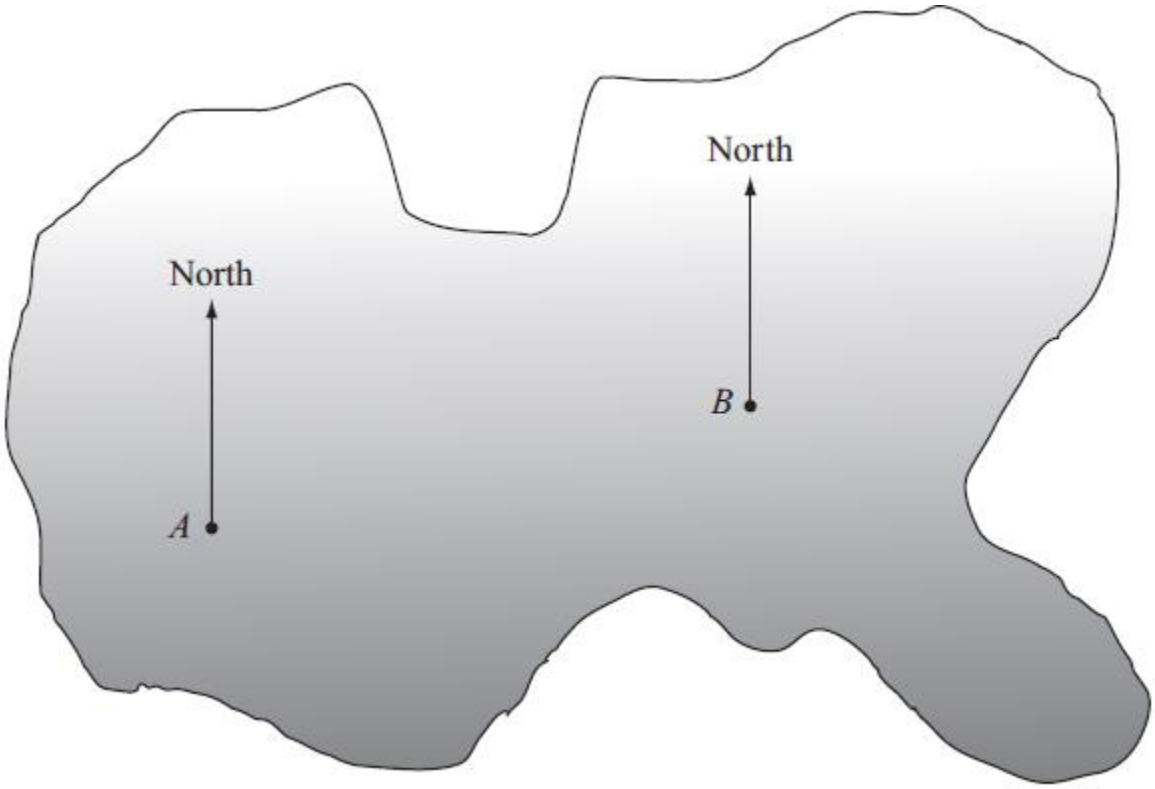
Each exterior angle of a regular polygon is 24°

Work out the number of sides of the polygon.

(Total for question = 2 marks)

Q11.

Here is a map of an island.



A and *B* are points on the island.
The scale of the map is 1 cm to 5 km.
(a) Find the real distance, in kilometres, between *A* and *B*.

(2)

(b) By measuring, find the bearing of *B* from *A*.

(1)

(c) Find the bearing of *A* from *B*.

(1)

Treasure is buried at a point **on** the island.
This point is 30 km from A and on a bearing of 320° from *B*.

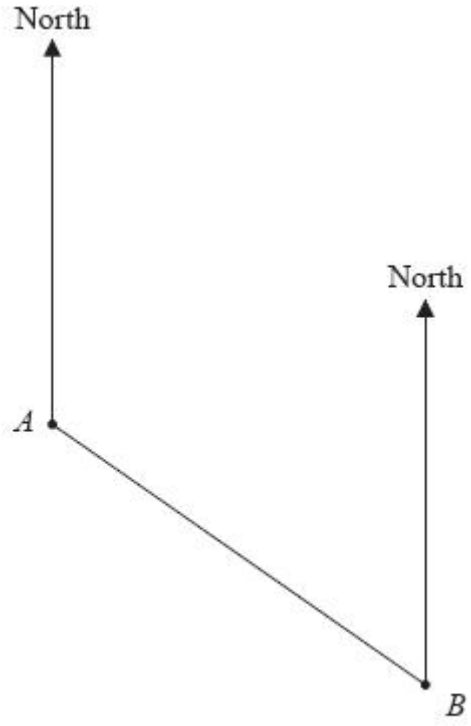
(d) Find the point on the map where the treasure is buried.
Mark this point with an *X*.

(2)

(Total for question = 6 marks)

Q12.

The scale diagram shows the position of two ships, *A* and *B*.



Scale: 1 cm represents 1 km

(a) Measure the bearing of *B* from *A*.

(1)

Another ship *C* is on a bearing of 070° from *B*.
Ship *C* is 7 km from *B*.

(b) Mark the position of ship *C* with a cross (×).

(2)

(Total for question = 3 marks)

Q13.

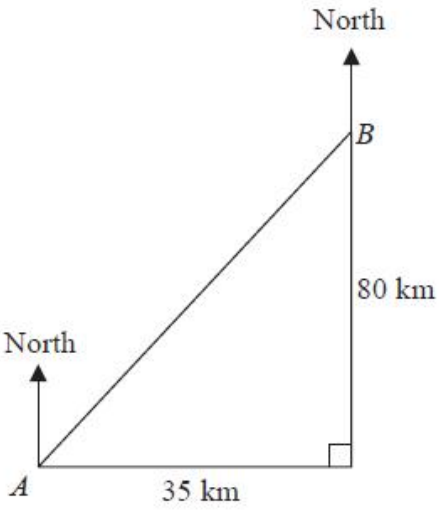


Diagram **NOT** accurately drawn

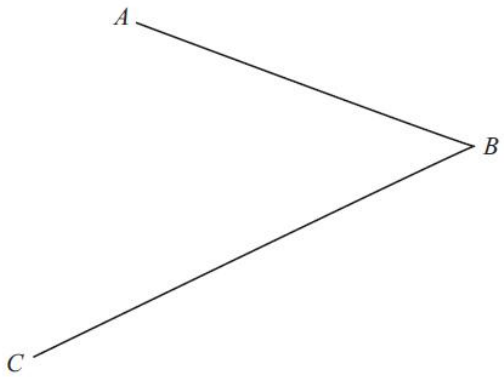
Town *B* is 35 km east and 80 km north of town *A*.

Work out the bearing of town *A* from town *B*.
Give your answer correct to the nearest degree.

(Total for question = 4 marks)

Q14.

Use ruler and compasses to construct the bisector of angle *ABC*.
You must show all your construction lines.



(Total for question = 2 marks)

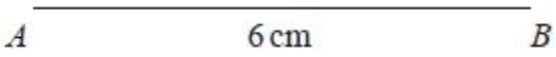
Q15.
ABC is a triangle.
AC = 4 cm and *BC* = 10 cm.
Use a ruler and compasses to **construct** the triangle *ABC* with *AB* as its base.
You must show all construction lines.

(Total for question = 2 marks)

Q16.

ABC is an isosceles triangle.
AB = 6 cm
AC = *BC* = 5 cm

Use ruler and compasses to construct triangle *ABC*.
You must show all your construction lines.
The line *AB* has been drawn for you.



(Total for question = 2 marks)

Q17.

Use ruler and compasses only to construct the perpendicular bisector of line *AB*.
You must show all your construction lines.

(Total for question = 2 marks)

Q18.

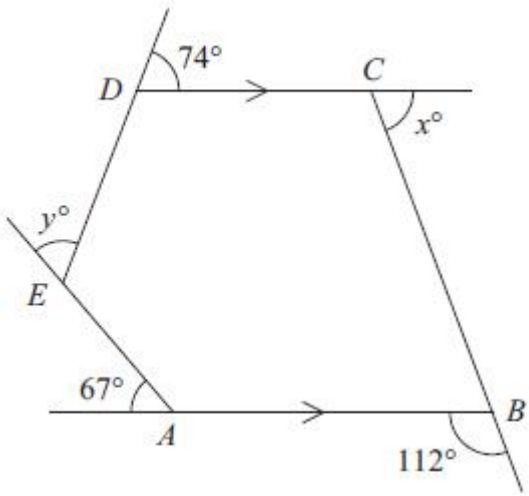


Diagram **NOT** accurately drawn

The diagram shows a pentagon *ABCDE*.
DC is parallel to *AB*.
The size of an exterior angle at *A* is 67°
The size of an exterior angle at *B* is 112°

The size of an exterior angle at C is $x°$
The size of an exterior angle at D is 74°
The size of an exterior angle at E is $y°$

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

(ii) Work out the value of y.

(4)

(b) Work out the sum of the interior angles of the pentagon $ABCDE$.

(2)

(Total for question = 6 marks)

Q19.

Work out the size of each exterior angle of a regular polygon with 15 sides.

..... °

(Total for question = 2 marks)

Q20.

Here is a regular 10-sided polygon.

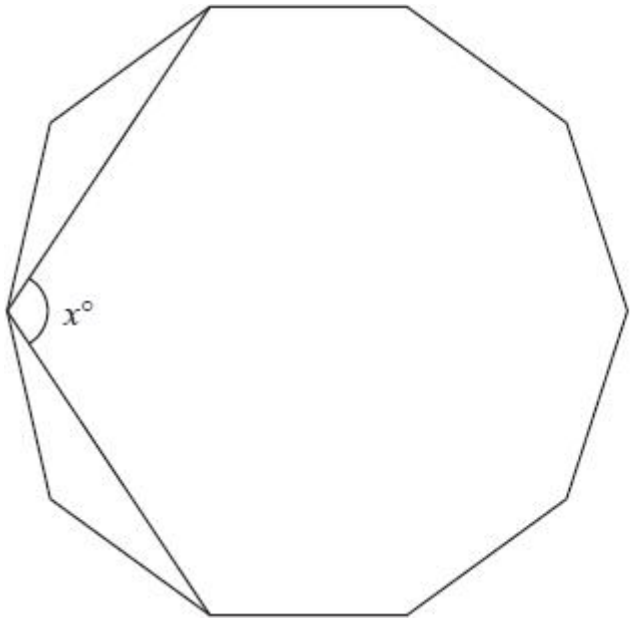


Diagram **NOT** accurately drawn

Work out the value of x.
Show your working clearly.

(Total for question = 4 marks)

Q21.

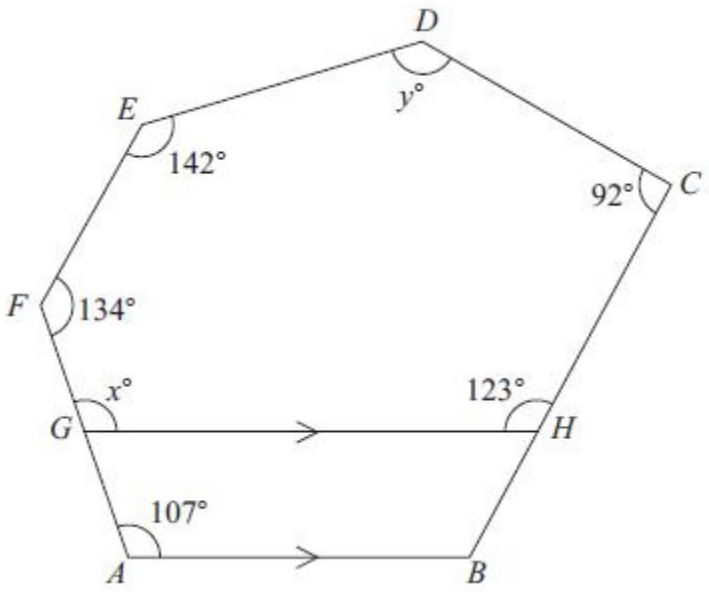


Diagram **NOT** accurately drawn

ABCDEF is a hexagon.
G is a point on *AF*.
H is a point on *BC*.
GH is parallel to *AB*.

(a) Give a reason why $x = 107$

(1)

(b) Work out the value of *y*.

(4)

(Total for question = 6 marks)

Q22.

Work out the size of an exterior angle of a regular polygon with 8 sides.

(Total for question = 2 marks)

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a)		Trapezium	1	B1 (any recognisable spelling) accept trapezoid
(b)		D and F or F and D	1	B1
(c)			1	B1 angle marked in correct place in A or C or E and no errors (can be an arc with no label)
(d)		4	1	B1
(e)		10	2	B2 B1 for 8=<area <10 or 10 <area =<12 or 5x2
				Total 6 marks

Q2.

Question	Working	Answer	Mark	Notes
	$\frac{20}{8}$ oe **or** 2.5 oe **or** $\frac{8}{20}$ oe **or** 0.4 oe Eg $6.4\times\frac{20}{8}+6.4$ **or** $CE=6.4\div\frac{8}{20}+6.4$	22.4	3	M1 for a correct scale factor M1 for a complete method to find *BE* A1

Q3.

Question	Working	Answer	Mark	Notes
(a)		cuboid	1	B1 Accept rectangular cuboid or rectangular prism. Do not accept cube
(b)		6.5	1	B1 Accept 6.4 – 6.6
(c)		A and F	1	B1 May be stated or could be circled in list
				Total 3 marks

Q4.

Ques		Working	Answer	Mark	Notes
	a		A and D	1	B1
	b		C	1	B1
	c		E	1	B1
					Total 3 marks

Q5.

Question Number	Working	Answer	Mark	Notes	
(a) (i)		(4, 5)	2	B1	cao
(ii)		(2, −1)		B1	cao
(b) (i)		x at (7, 4)	2	M1	Allow ± 2 mm Condone omission of label
(ii)		rectangle drawn		A1	dep on M1
(c)		2	1	B1	
(d)		(3, 2)	2	B2	B1 for 3 B1 for 2
					Total 7 marks

Q6.

Q	Working	Answer	Mark	Notes
(a)		16	1	B1
(b)		26	1	B1
(c)		2	1	B1
(d)		2 correct lines drawn with no incorrect lines	2	B2 If not B2 then award B1 for one correct line (ignore any incorrect lines and any lines that may been drawn to assist with counting squares in (a))
				Total 5 marks

Q7.

Q	Working	Answer	Mark	Notes
	(10 – 2) × 180 oe (= 1440) **or** (6 – 2) × 180 oe (= 720)		4	M1 for a method to find the sum of the interior angles of a decagon or a hexagon
	'1440' – 148 – 2×150 – 2×168 – 2×134 – 2×125 (=138) **or** '1440' – 1302 (= 138) **or** '720' – 148÷2 – 150 – 168 – 134 – 125 (= 69) **or** '720' – 651 (= 69)			M1 Allow omission of one angle
	360 – '138' **or** 360 – 2 × '69'			M1
		222		A1
	Alternative method (exterior angles)			
	360 – 2×(180 – 125) – 2×(180 – 134) – 2×(180 – 168) – 2×(180 – 150) – (180 – 148) **or** 360 – 2×55 – 2×46 – 2×12 – 2×30 – 32		4	M2 If not M2 then award M1 for at least 3 or (180 – 125) , (180 – 134) , (180 – 168) , (180 – 150), (180 – 148) or at least 3 of 55, 46, 12, 30, 32
	180 + '42'			M1
		222		A1
				Total 4 marks

Q8.

Q	Working	Answer	Mark	Notes
	[interior angle of pentagon =] 540 ÷ 5 (= 108) oe or [exterior angle of pentagon =] 360 ÷ 5 (= 72)		3	M1 for a correct calculation for an interior or an exterior angle of a regular pentagon
	360 – (90 + "108") or 90 + "72" or 180 – ("108" – 90) oe			M1 for a fully correct method "108" or "72" must come from correct working and be used correctly
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	162		A1
				Total 3 marks

Q9.

Question	Working	Answer	Mark	Notes
	180 – 140 (= 40) **or** 180(n – 2) = 140n oe		3	M1 Correct method to find exterior angle or correct substitution into formula
	360 ÷ '40' **or** 40n = 360 oe			M1
		9		A1
				Total 3 marks

Q10.

Question	Working	Answer	Mark	Notes
	360 ÷ 24 (n – 2)180 = (180 – 24)n		2	M1 A fully correct method to find the number of sides of the polygon or correct use of formula with use of 24
		15		A1
				Total 2 marks

Q11.

Q	Working	Answer	Mark	Notes
(a)	6.3 → 6.5 (inclusive) x 5	31.5 → 32.5 inclusive	M1 2 A1	
(b)		076 → 080 inclusive	1	B1 leading zero not necessary
(c)		256 →260 inclusive	1	B1 ft from (b) if (b) is
				acute {180 + (b) oe}
(d)	1 bearing line or 1 arc drawn correctly from A or B	Cross in correct position	M1 2 A1 dep on M1 (see overlay)	
				Total 6 marks

Q12.

Q		Working	Answer	Mark	Notes	
	(a)		123° - 127°	1	B1	
	(b)	Bearing of 070° from *B* and 7 cm from *B*	Correct angle and length	2	B1 B1	Correct bearing within overlay A point 7cm from *B*. Accept 6.8cm -7.2cm
						Total 3 marks

Q13.

Q	Working	Answer	Mark	Notes
	$\tan A = \frac{80}{35}$ or $\tan B = \frac{35}{80}$		4	M1
	$(A =) \tan^{-1}\left(\frac{80}{35}\right)$ or $(B =) \tan^{-1}\left(\frac{35}{80}\right)$			M1
	$(A =)$ 66.37... or $(B =)$ 23.62...			A1 Accept answers that round to 66 or 24(allow answers without labels)
		204		B1 Allow answers in range 203.6 – 204 ft for correct conversion to bearing unless 180 + 66
				Total 4 marks

Q14.

Q	Working	Answer	Mark	Notes
	arc centre B cutting BA and BC at (say) P and Q		2	M 1
	arcs centres P and Q of equal radii which intersect at R (say) and BR joined (overlay)			A dep 1
				Total 2 marks

Q15.

Question number	Working	Answer	Mark	Notes
		Triangle drawn with correct intersecting arcs from A (4cm) and B (10cm)	2	B2 Arcs intersect within overlay B1 for correct 4cm arc from A or 10 cm arc from B Accurate triangle with no arcs scores zero.
				Total 2 marks

Q16.

Question	Working	Answer	Mark	Notes
			2	M1 for triangle with $AC = BC$ with relevant arcs or $AC = 5$ cm or $BC = 5$ cm with relevant arcs or correct triangle with no arcs
		A correct triangle		A1 A correctly drawn triangle with relevant arcs at C (vertex within intersection on overlay)
				Total 2 marks

Q17.

Question	Working	Answer	Mark	Notes
		bisector with construction arcs	2	B2 for bisector within guidelines with two pairs of relevant construction arcs seen If not B2 then B1 for a bisector within guidelines with no arcs present **or** relevant arcs present with no bisector
				Total 2 marks

Q18.

Question Number	Working	Answer	Mark	Notes
(a)(i)	$\angle ABC = 68°$ **or** $\angle BCD = 112°$		4	M1 May be stated or marked on diagram
		68		A1 cao
(ii)	360 − (67 + 112 + "68" + 74)			M1
		39		A1 ft from their (a)(i) Award 2 marks if the answer to (ii) is 107 − answer to (i)
(b)	(5 − 2) × 180 **or** 3 × 180 **or** (2 × 5 − 4) × 90 **or** 6 × 90 **or** 360 + 180 **or** (180−67) + (180−112) + (180−"68") + (180−74) + (180−"39") **or** 113 + 68 + 112 + 106 + 141		2	M1 Condone 1 incorrect interior angle
		540		A1 Cao SC B1 for 108
				Total 6 marks

Q19.

Question	Working	Answer	Mark	Notes
	360 ÷ 15			M1
		24	2	A1
				Total 2 marks

Q20.

Question	Working	Answer	Mark	Notes
	$180 - \frac{360}{10}$ or $\frac{(10-2)\times 180}{10}$ or 144 oe		4	M1 Unless inconsistently labelled
	$\frac{180-'144'}{2}$ or 18			M1 Or M2 for 144 – (180 – 144)
	'144' – 2 × '18'			M1
		108		A1 dep on M1
	Alternative			
	Pentagon approach – drawing in a pentagon or a statement recognising that the required angle is one of a regular pentagon		4	M1 May be implied by further work
	$180 - \frac{360}{5}$ or $\frac{(5-2)\times 180}{5}$			M2 (M1 for exterior angle of pentagon as long as not seen as interior angle or given as answer)
		108		A1 dep on M1
				Total 4 marks

Q21.

(a)	corresponding (angle(s))		1	B1 oe eg x corresponds to angle A; corresponding to angle A	
(b)	(6 – 2) × 180 **or** 4 × 180 **or** (2 × 6 – 4) × 90 **or** 8 × 90 **or** 120 × 6 **or** (180 – 60)×6 **or** 360 + 360		4	M1	360−(73+46+38+88+57) Condone one incorrect ext angle
	720			A1 M1 A1 for 720 seen	58 M1 A1 for 58 seen
	"720" – (107 + 134 + 142 + 92 + 123) or "720" – 598			M1 dep on first M1	180 – "58"
		122		A1	
					Total 5 marks

Q22.

Q	Working	Answer	Mark	Notes
	$\frac{360}{8}$ or $180-\frac{(8-2)\times 180}{8}$	45	2	M1 For complete correct method for exterior angle A1 Do not isw interior angle found
				Total 2 marks