St. Patrick's High School, Keady

Mathematics Department

GCSE Mathematics Practice Booklet

M2

Topic 5 – Geometry and Measure 2

Shape Properties

2D Shapes and 3D objects

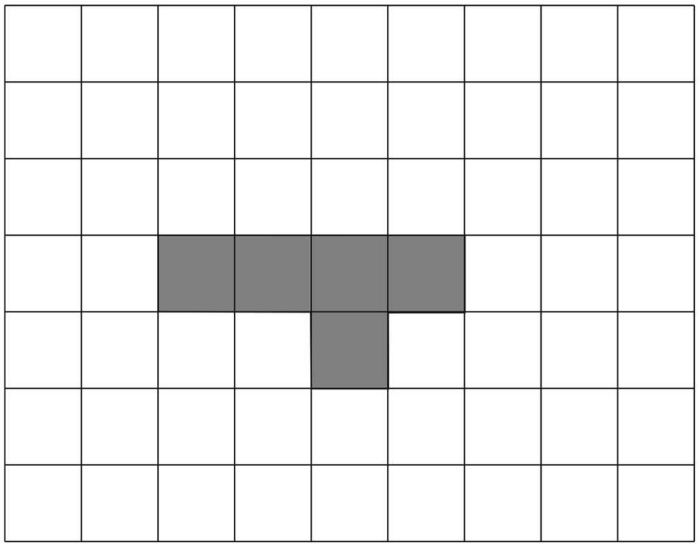
Angles

Questions taken from CCEA Past Papers

Mark Scheme included at the end of this booklet

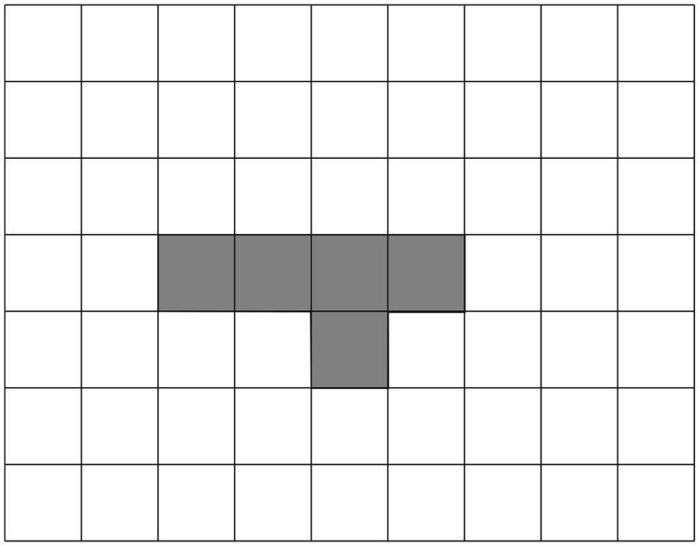
Keady Maths

Q1 **(a)** Shade one more square so that the shape will have one line of symmetry but no rotational symmetry.



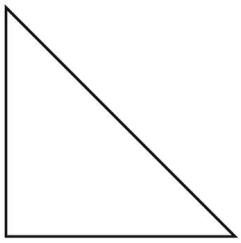
[1]

(b) Shade one more square so that the shape will have no lines of symmetry but will have rotational symmetry of order 2.



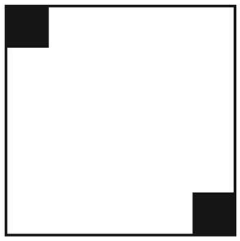
[1]

Q2 **(a)** Draw a line of symmetry on the shape below.



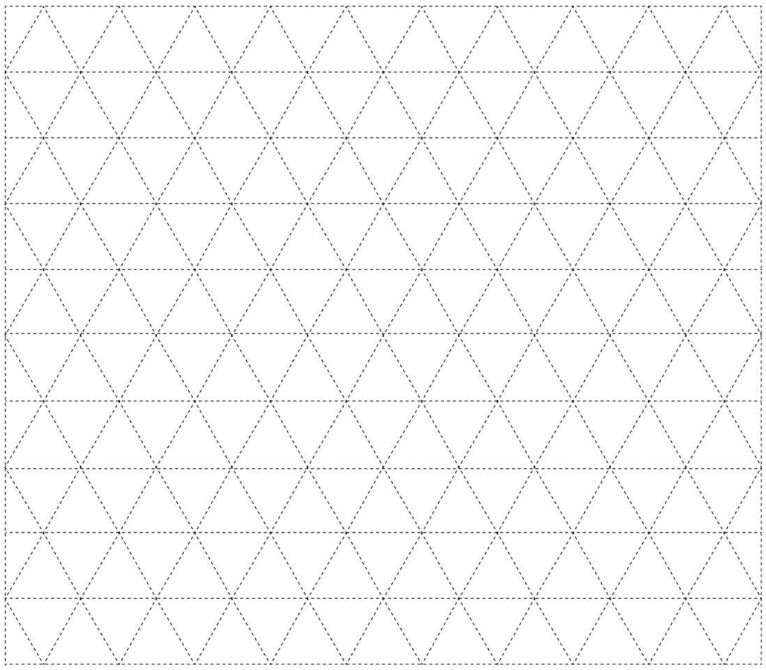
[1]

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



[1]

(c) On the grid below, draw a hexagon which has **only** two lines of symmetry.



[1]

Q3

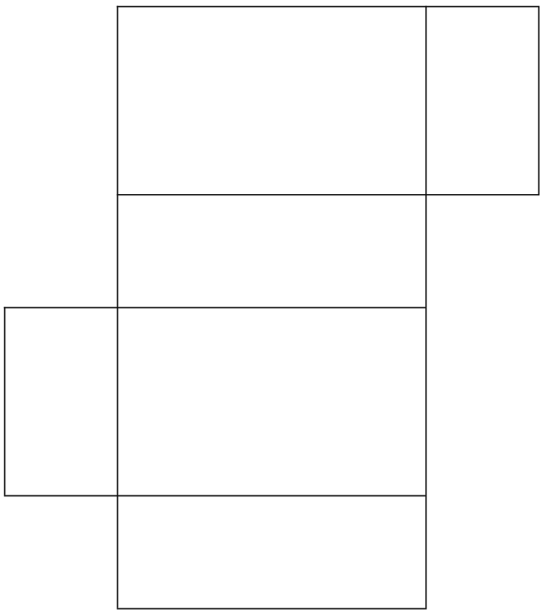


Diagram not drawn accurately

The lengths of the sides in the net are 2 cm, 3 cm and 5 cm.

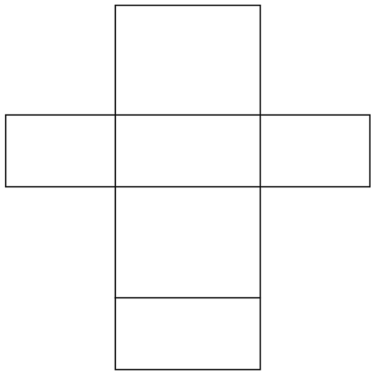
(a) What 3D shape can be made using this net?

Answer _____ [1]

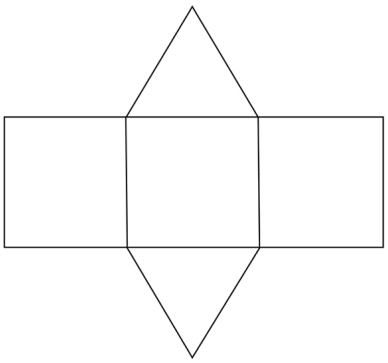
(b) What is the volume of the 3D shape?

Answer _____ cm^3 [2]

Q4 **(a)** Name the 3D shapes which can be made by folding these nets.

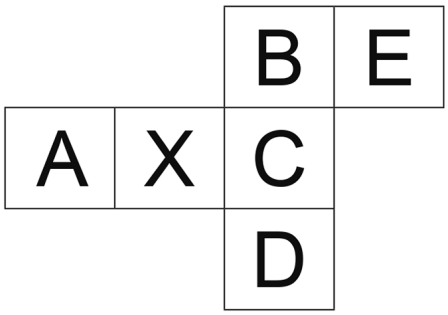


(i) _____ [1]



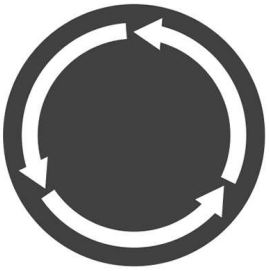
(ii) _____ [1]

(b) This net is folded to make a cube. Which letter will be opposite X?



Answer _____ [1]

Q5



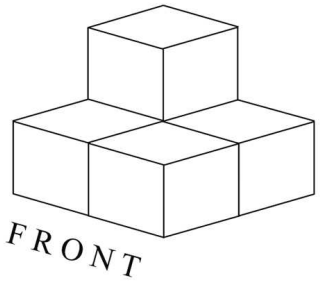
(a) How many lines of symmetry does the sign have?

Answer _____ [1]

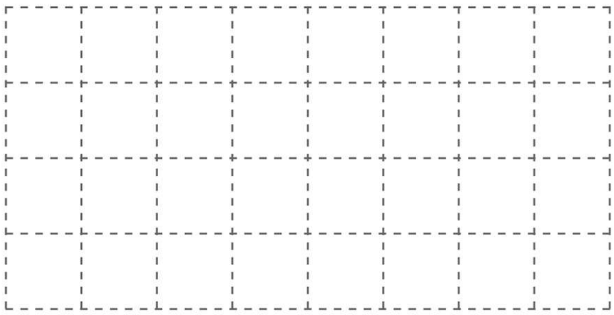
(b) What is the order of rotational symmetry of the sign?

Answer _____ [1]

Q6 The diagram below shows a 3-dimensional shape.

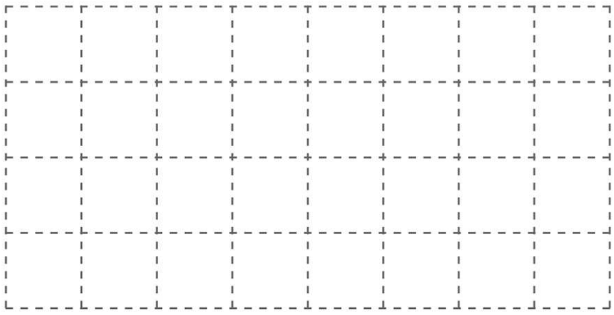


(a) On the square grid, draw the plan for the shape.



[1]

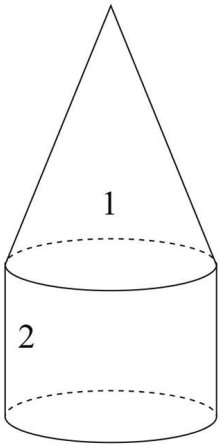
(b) On the square grid below, draw the front elevation of the shape.



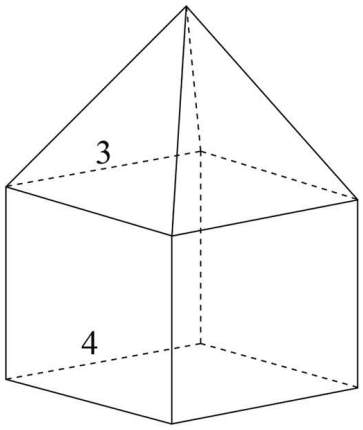
[2]

Q7 Each of the shapes below is made by joining two different solids together.

(a) Fill in the names of the solids under each shape.



Shape A



Shape B

Solid 1 _____ Solid 3 _____

Solid 2 _____ Solid 4 _____

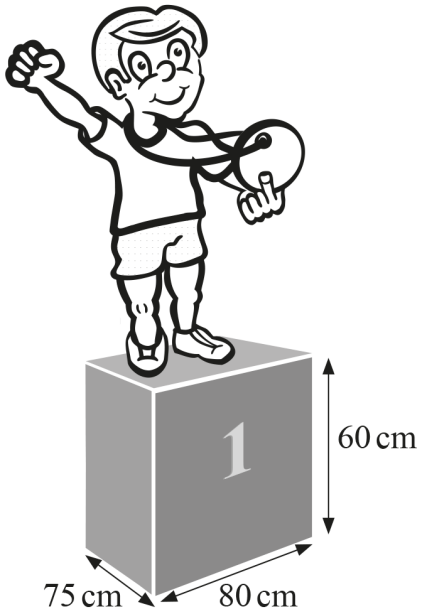
[4]

(b) Complete the following table for **Shape B**.

Number of Faces	Number of Edges	Number of Vertices

[3]

Q8 A winners' podium (a cuboid) is shown.



(a) How many **vertices** has the podium?

Answer _____ vertices [1]

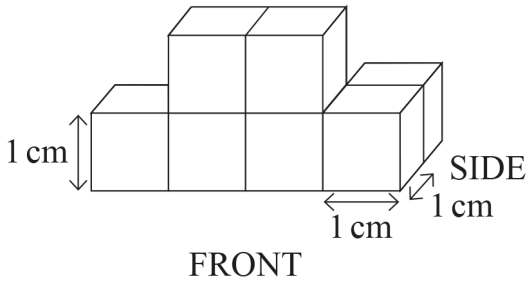
(b) What is the area of the **base** of the podium?

Answer _____ cm^2 [2]

(c) What is the volume, in $\mathbf{m^3}$, of the podium?

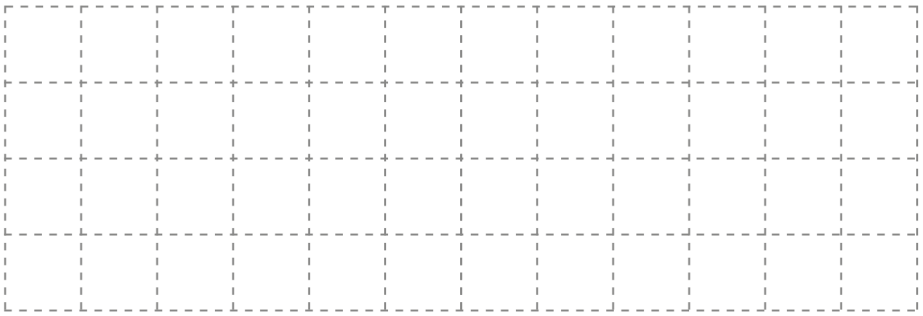
Answer _____ m^3 [2]

Q9

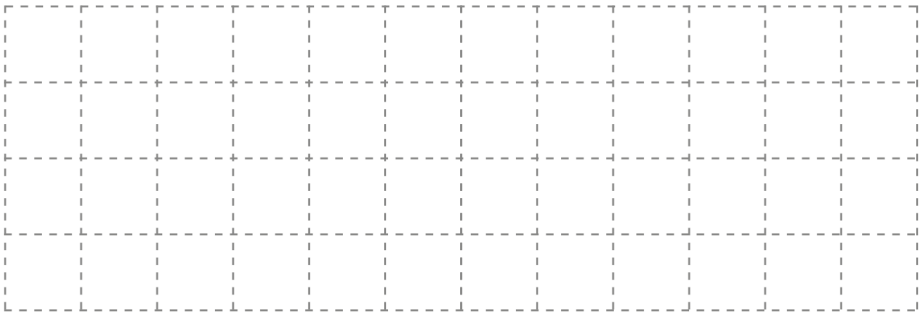


Draw the front and side elevations on the grid below.

FRONT



SIDE



[3]

Q10

(a) Work out the size of the angle marked x.

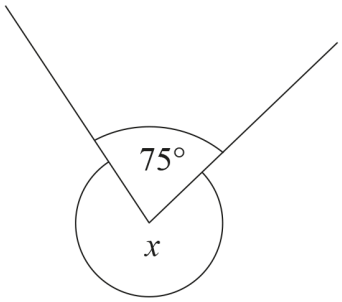


diagram not
drawn accurately

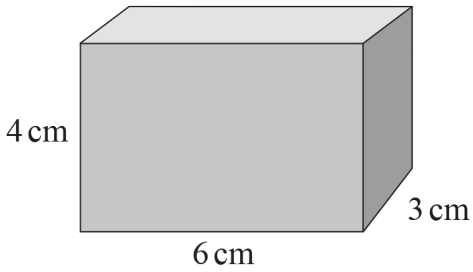
Answer _____ ° [1]

(b) Circle the name of the quadrilateral with rotational symmetry of order 2

square kite parallelogram trapezium [1]

Look at the box below.

(c) **(i)** How many 1 cm cubes are needed to fill this box?



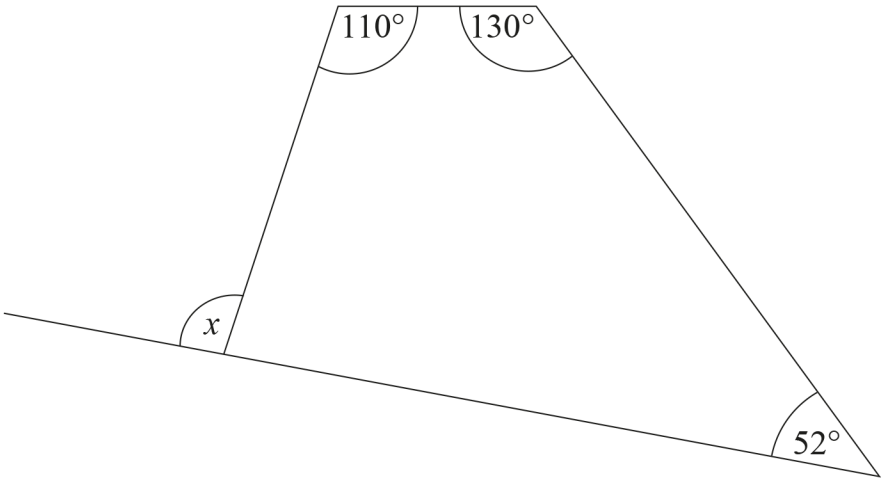
Answer _____ cubes [1]

(ii) What is the perimeter of the top face of the box?

Answer _____ cm [1]

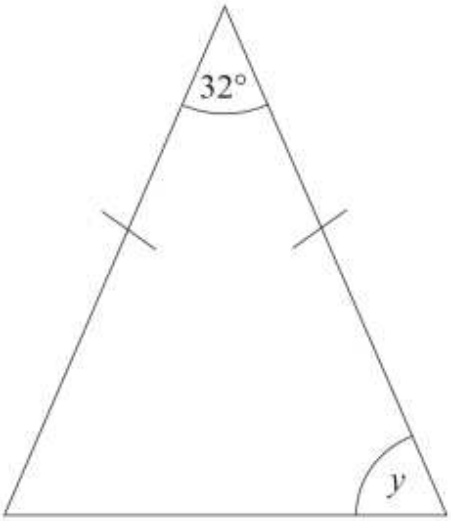
Q11

(a) Work out the size of the angle x in the diagram below.



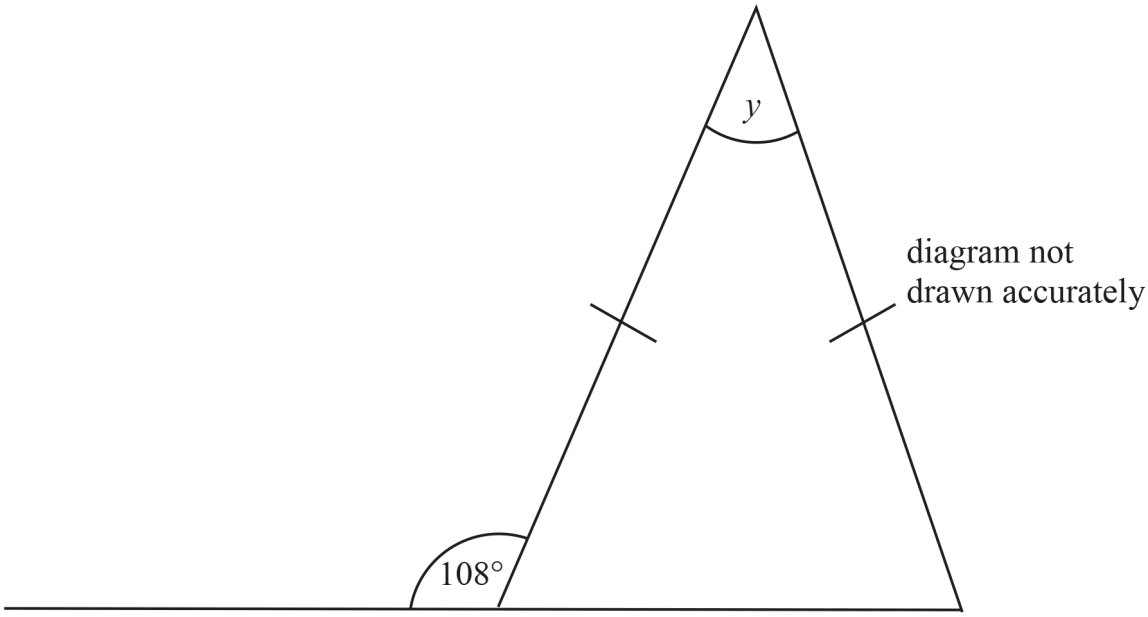
Answer _____° [3]

(b) Work out the size of the angle y in the diagram below.



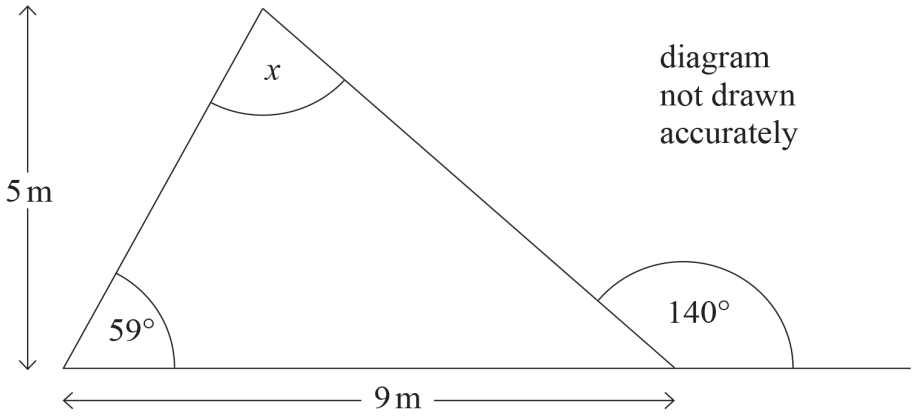
Answer _____ ° [2]

Q12 Work out the size of angle y in the diagram below.



Answer y = _____° [3]

Q13



(a) Calculate the size of angle x.

Answer _____ ° [3]

(b) Calculate the area of the triangle.

Give the correct unit of measurement with your answer.

Answer _____ [3]

Q14 Work out the size of the angle w.

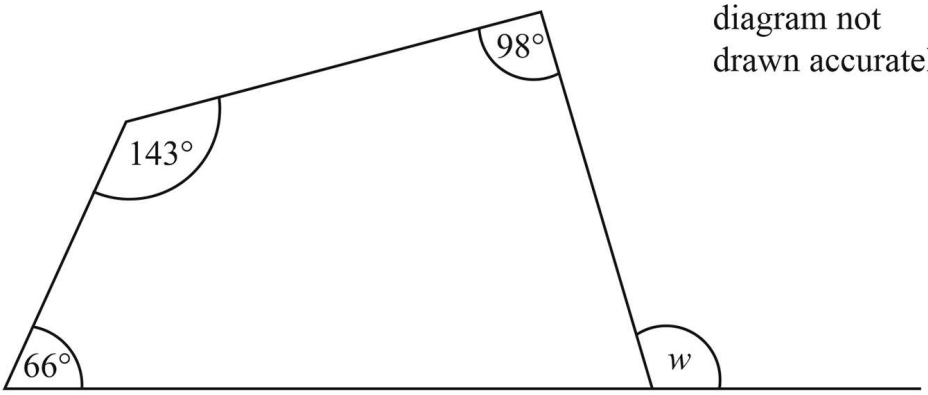
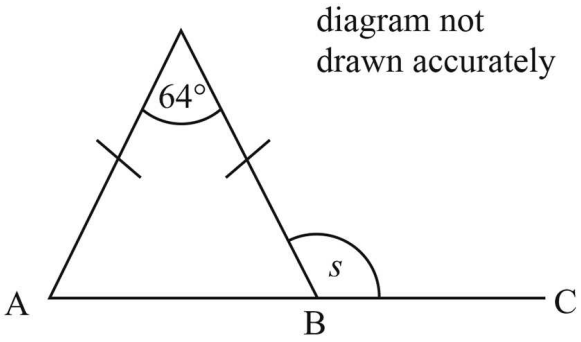


diagram not drawn accurately

Answer $w =$ _____ ° [3]

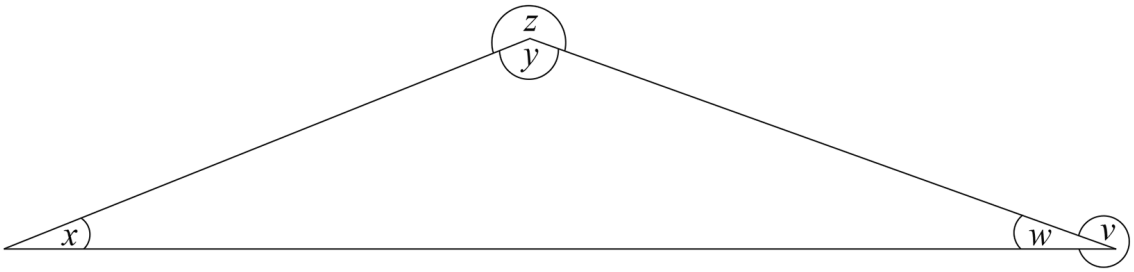
Q15 The triangle shown is isosceles. ABC is a straight line.



Work out the size of the angle s.

Answer s = _____ ° [3]

Q16



(a) Measure the angle x.

Answer _____° [1]

(b) From the diagram, name

(i) an obtuse angle,

Answer _____ [1]

(ii) a reflex angle.

Answer _____ [1]

Q17 Calculate the size of angle x in this quadrilateral.

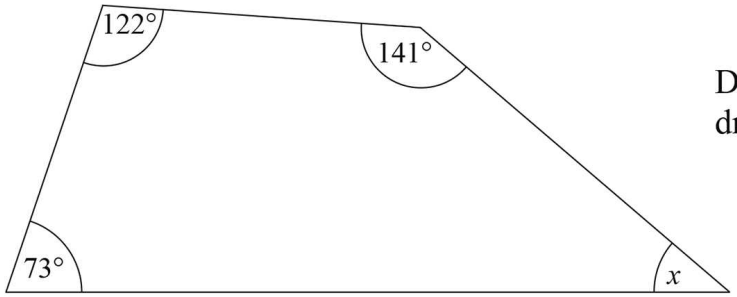
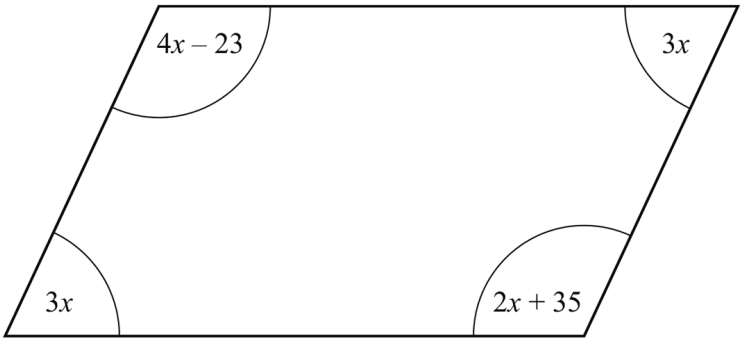


Diagram not drawn accurately

Answer $x =$ _____ ° [2]

Q18



The diagram above is a parallelogram.
The sizes of the angles in degrees are $3x$, $4x - 23$, $3x$ and $2x + 35$
Work out the value of x.

Answer $x =$ _____ [3]

Q19

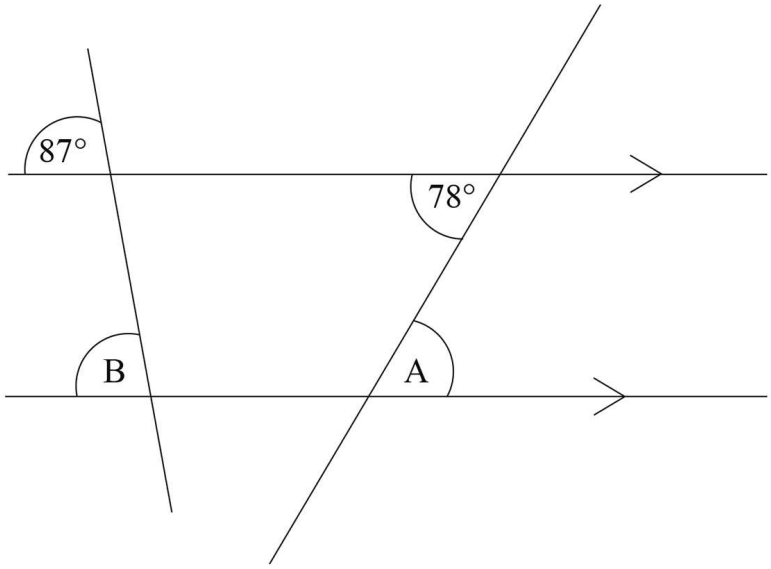


diagram not drawn accurately

Find the size of angle

(a) A Answer _____° [1]

(b) B Answer _____° [1]

Q20 Work out the size of the missing angle in each of the diagrams below.

(a)

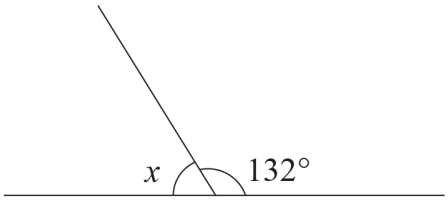


diagram not
drawn accurately

Answer x = _____ ° [1]

(b)

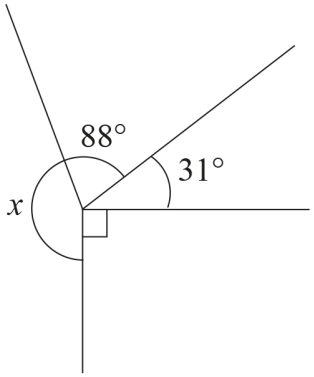


diagram not
drawn accurately

Answer x = _____ ° [1]

(c)

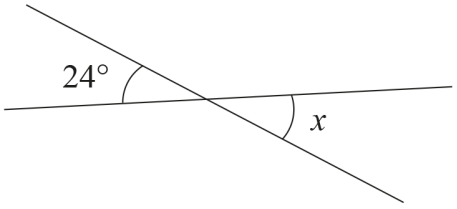


diagram not
drawn accurately

Answer x = _____ ° [1]

Q21

17

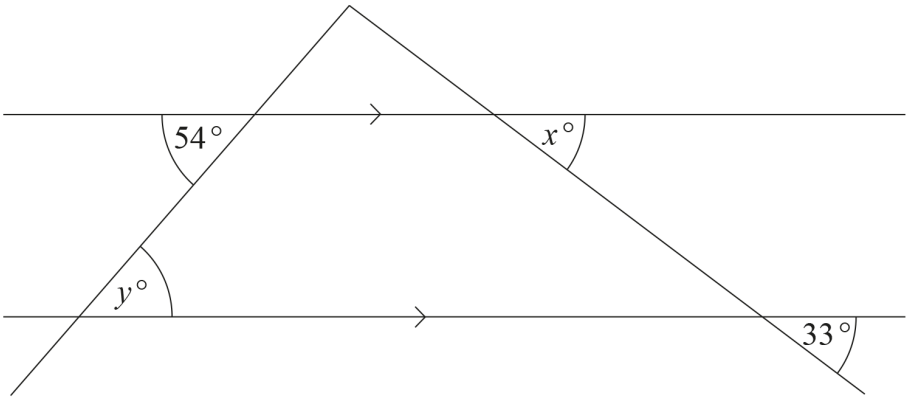


diagram not drawn accurately

Write down the values of x and y.

Answer x = _____ [1]

Answer y = _____ [1]

Q22

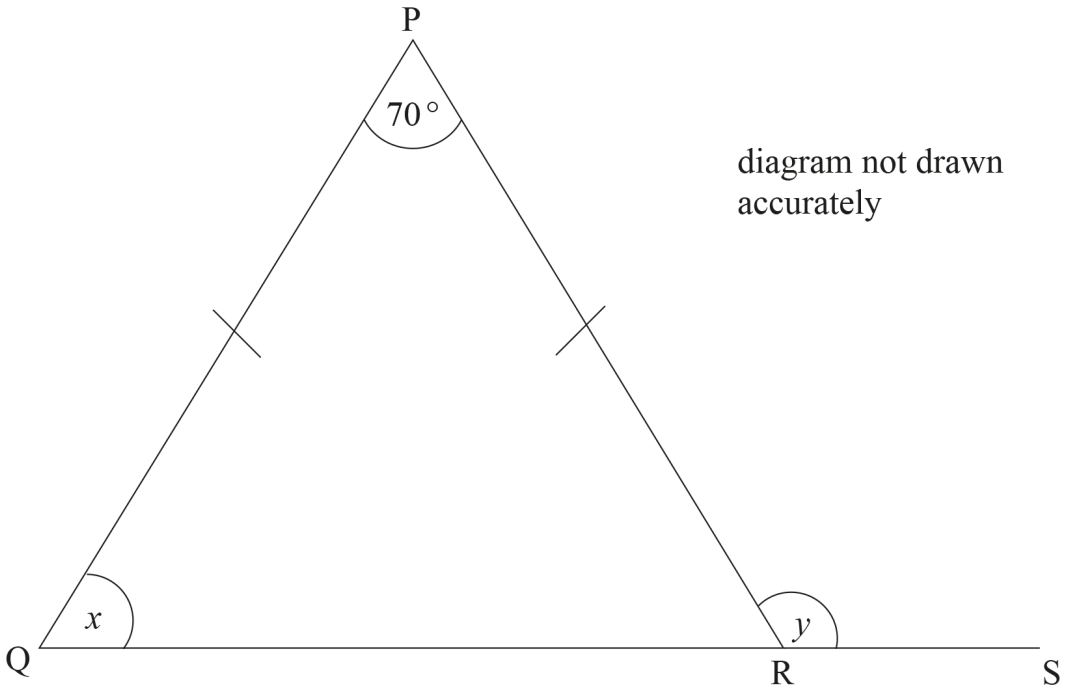


diagram not drawn accurately

PQR is an isosceles triangle with PQ = PR.
QRS is a straight line.

(a) Work out the size of the angle marked x.

Answer _____ ° [2]

(b) Work out the size of the angle marked y.

Answer _____ ° [1]

Q23

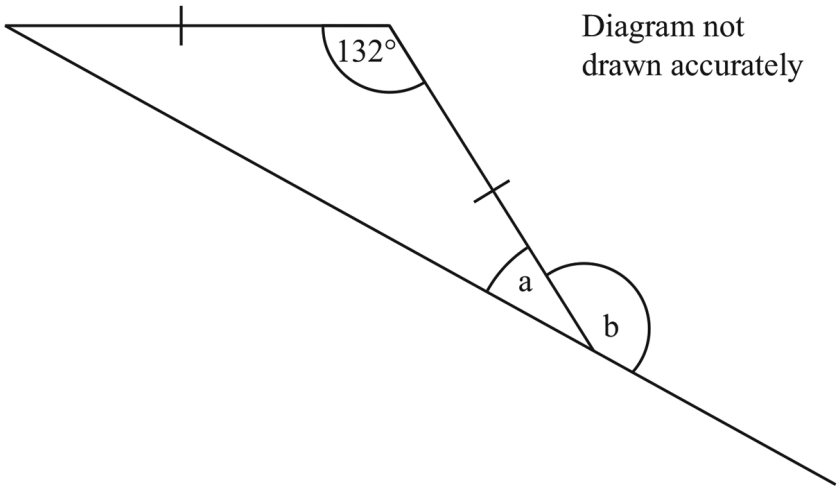


Diagram not drawn accurately

Find the size of

(a) angle a

Answer a = _____° [2]

(b) angle b

Answer b = _____° [1]

Q24

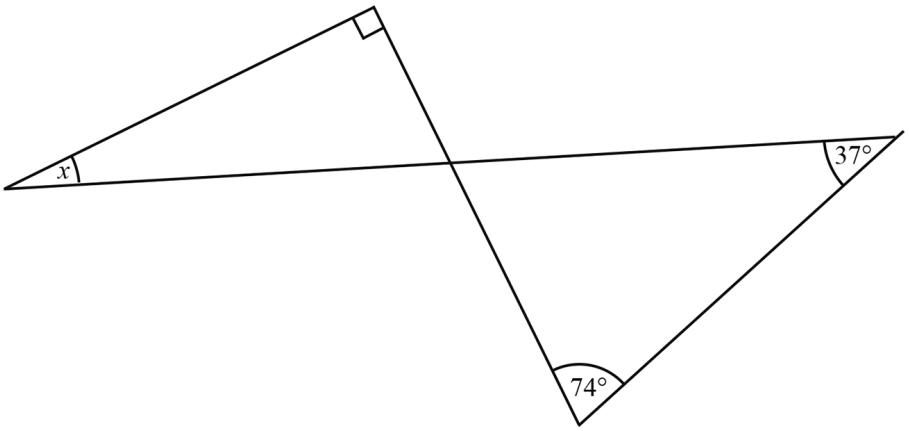


diagram not drawn accurately

Calculate the size of the angle marked x.

Answer _____ ° [3]

Q25 In the diagram lines AB and CD are parallel.

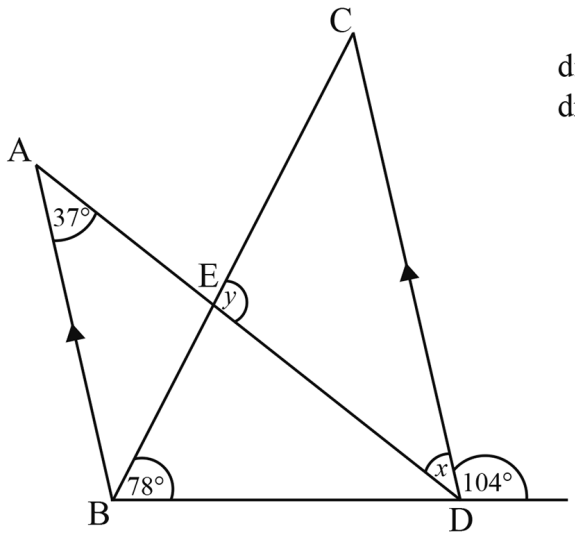


diagram not drawn accurately

(a) Find the size of the angle x.

Answer _____ ° [1]

(b) Calculate the size of the angle y.

Answer _____ ° [2]

Q26

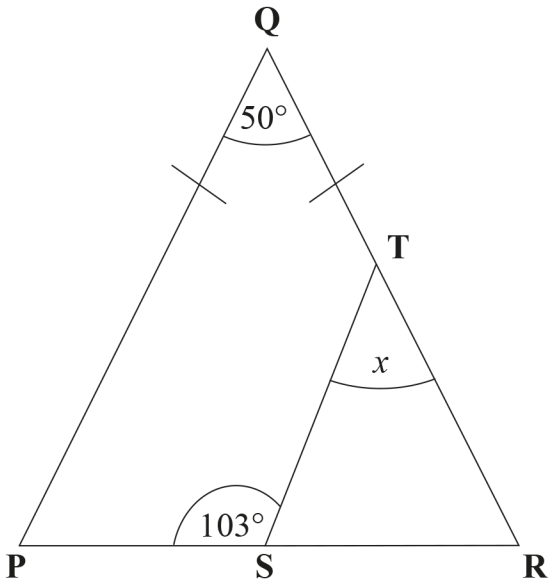


diagram
not drawn
accurately

Triangle PQR is isosceles with PQ = QR.

(a) Calculate the size of angle x

Answer _____° [3]

(b) Hence decide if the lines PQ and ST are parallel.

_____ because _____

_____ [2]

Q27

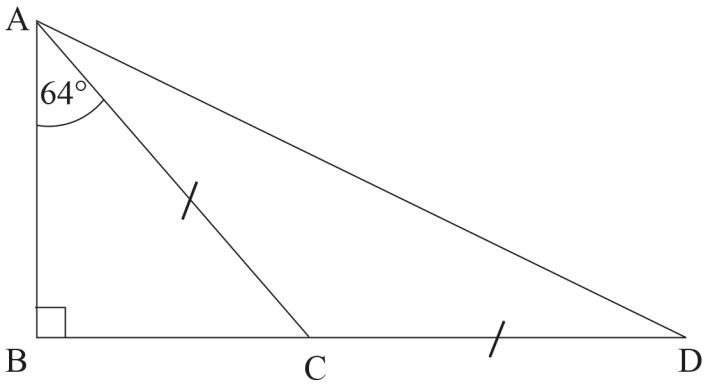


diagram not drawn accurately

ABC is a right-angled triangle.
ACD is an isosceles triangle.
BCD is a straight line.

Calculate the size of

(a) angle ACB,

Answer _____ ° [2]

(b) angle ADC.

Answer _____ ° [3]

Q28

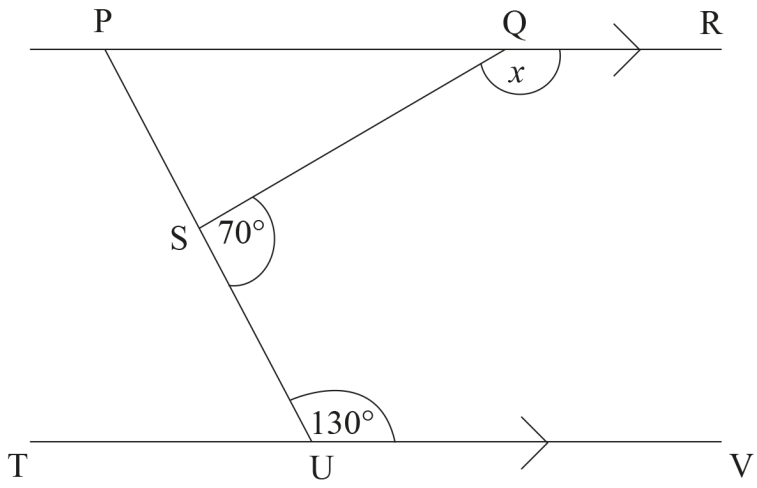


diagram
not drawn
accurately

PR and TV are parallel lines.

Calculate the size of angle x.

Answer _____° [3]

Q29

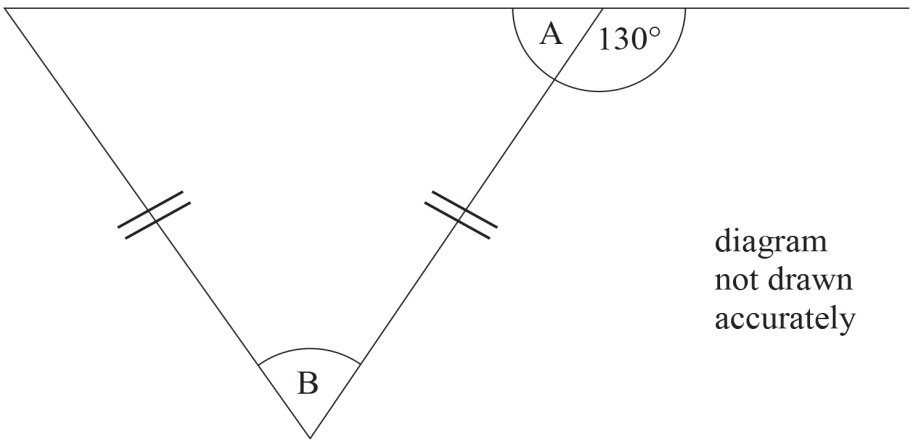


diagram
not drawn
accurately

Work out the sizes of the angles marked A and B in the diagram.

Answers A = _____ °

B = _____ °

[3]

Q30

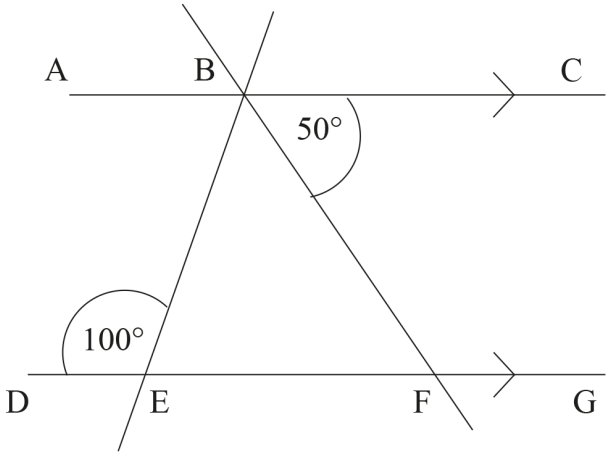


diagram not drawn accurately

AC and DG are parallel lines.

Angle CBF = 50° and angle BED = 100°

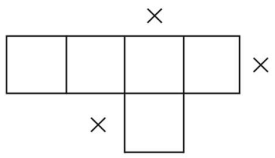
What type of triangle is BEF?

Give a reason for each angle found.

Answer _____ [3]

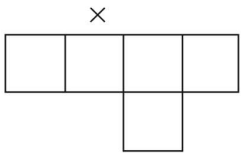
1. **(a)** correct square shaded A1

three possible answers as shown



(b) correct square shaded A1

one possible answer as shown



---

2. **(a)** Line correctly drawn A1

(b) Line correctly drawn A1

(c) Suitable hexagon drawn A1

---

3. **(a)** cuboid A1

(b) 30 M1 A1

---

4. **(a)** **(i)** Cuboid A1

(ii) Triangular Prism A1

(b) E A1

---

5. **(a)** none A1

(b) 3 A1

---

6. **(a)** 2 by 2 square A1

(b) 2 squares as base and 1 square up left side A2

---

7. **(a)** Shape A Cone and Cylinder A1 A1

Shape B Pyramid and Cube or Cuboid A1 A1

(b) 9 16 9 A1 A1 A1

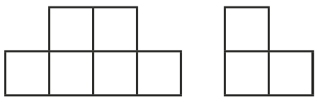
8.

(a) 8 A1

(b) 80×75, 6000 M1 A1

(c) $0.8 \times 0.75 \times 0.6 = 0.36$ M1 A1

9.



M1 A1 A1

M1 for idea of elevations

10.

(a) 285 A1

(b) parallelogram circled A1

(c) **(i)** 72 A1

(ii) 18 A1

11.

(a)	$360 - (110 + 130 + 52)$	MA1
	68	MA1
	112	A1
(b)	$(180 - 32) \div 2$	MA1
	74	A1

12.

$180 - 108 = 72$	MA1
$180 - (72 \times 2)$	MA1
36	A1

13.

(a)	$180 - 140 = 40$	MA1
	$180 - (59 + 40)$	MA1
	81	A1
(b)	$9 \times 5 \div 2$	MA1
	22.5	A1
	m^2	A1

14. 360 – (66 + 143 + 98) or 360 – 307 MA1
53 A1
127 MA1

15. (180 – 64) ÷ 2 M1
58 A1
122 MA1

16. **(a)** angle measured ±2° –22° A1

(b) **(i)** y A1

(ii) v or z A1

17. 360 – (122 + 141 + 73) or 360 – 336 M1
24 A1

18.

$4x - 23 = 2x + 35$	**or**	$3x + 4x - 23 + 3x + 2x + 35 = 360$	M1
$2x = 58$	**or**	$12x = 348$	MA1
$x = 29$		$x = 29$	MA1

or

$4x - 23 + 3x = 180$	**or**	$2x + 35 + 3x = 180$	M1
$7x = 203$	**or**	$5x = 145$	MA1
$x = 29$		$x = 29$	MA1

19.

(a) 78° A1

(b) 87° A1

20.

(a) 48 A1

(b) 151 A1

(c) 24 A1

21.

33 A1

54 A1

22.

(a) $(180 - 70) \div 2$ M1

55 A1

(b) 125 A1

23.

(a) $180 - 132 = 48$ M1
$48 \div 2$
24 A1

(b) $180 - (a) = 156$ MA1

24.

$180 - (74 + 37) = 69$ MA1

vertically opposite angle = 69 A1

$x = 180 - (90 + 69) = 21$ MA1

---

25. **(a)** 37° A1

(b) ABE = 104 – 78 = 26° MA1

AEB = 180 – (26 + 37) = 117° = y MA1

or

EDB = 180 – (104 + 37) = 39°

BED = 180 – (78 + 39) = 63° MA1

y = 180 – 63 = 117° MA1

or

BDC = 76°

BCD = 180 – (76 + 78) = 26° MA1

y = 180 – (26 + 37) = 117° MA1

-

---

26. **(a)** QPR = QRS = 65° (mark gained for angle QRS as 65 in diagram) MA1
TSR = 77° (may be marked in diagram) MA1
x = 180 – (77 + 65) = 38° (3 marks for correct ans) MA1

(b) No because 50 + 142 ≠ 180°
or because 65 + 103 ≠ 180°
or because the angles between the two lines do not add up to 180 so not parallel
or because 38 ≠ 50, corresponding.
Allow A1 for numerical error but correct argument A2

27.

(a) 180 – 90 – 64 **or** 90 – 64 M1

= 26 A1

(b) 180 – 26 = 154 MA1

$\frac{180 - 154}{2}$ M1

= 13 A1

28.

QSP = 110 MA1

TUP = 50 so QPU = 50 (alternate) MA1

PQS = 180 – (50 + 110) = 20, x = 180 – 20 = 160 MA1

29.

A = 50° A1

B = 180 – (2 × 50) = 80° M1A1

30.

angle BFE = 50, alternate MA1

angle BEF = 80, angles on straight line add to 180° MA1

angle EBF = 50, angle sum of triangle, so triangle is isosceles MA1
