Name	Date started	Target end date

WJEC GCSE Mathematics and Numeracy (Double Award) — Question Pack

Foundation angle facts at a single point and inside basic shapes: angles on a straight line summing to 180°, angles round a point summing to 360&d

REVISE
.wales

F2.15 — Angle facts — points, lines, triangles & quadrilaterals

Spec 3.4.1, 3.4.2 — Unit 2 (no calculator)

Foundation angle facts at a single point and inside basic shapes: angles on a straight line summing to 180°, angles round a point summing to 360°, vertically opposite angles being equal, the interior angles of any triangle summing to 180°, and the interior angles of any quadrilateral summing to 360°. Sourced from legacy WJEC GCSE Mathematics-Numeracy Foundation papers (3300U10/U20) and accessible content from Intermediate papers (3300U30/U40), organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~4 hours 3 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (162 marks across 73 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification.

Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working — method marks are awarded for clear setup.

*A calculator is **not** permitted on any question in this pack (Unit 2 is the non-calculator paper).*

Angle facts — points, lines, triangles & quadrilaterals — what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 2: non-calculator.

Points and lines 3.4.1

- Use the angles on a straight line sum to 180°.
- Use the angles around a point sum to 360°.
- Apply the vertically opposite angles property.

Triangles 3.4.2

- Use the triangle interior angle sum (180°).
- Use the equal base angles of an isosceles triangle.
- Recall that an equilateral triangle has three 60° angles.

Quadrilaterals 3.4.2

- Use the quadrilateral interior angle sum (360°).
- Recall right angles in squares and rectangles.
- Use parallel-side properties of a parallelogram or trapezium.

Exam strategy 3.4

- Non-calculator — quote the fact by name ("angles on a line", "angles in a triangle").
- Mark equal angles on the diagram before solving.
- Check totals: line → 180°, point → 360°, triangle → 180°, quad → 360°.

Crib sheet »

Angle facts — points, lines, triangles & quadrilaterals in one page

Quick-reference notes — revisit before each question. Don't use during the questions.

Angles on a line

Angles that sit on a straight line add to **180°**. If one angle is *a*, the other is *180° − a*.

Angles round a point

Angles meeting at a single point add to **360°**.

Vertically opposite

When two straight lines cross, the angles directly opposite each other are **equal**.

Triangle angle sum

The three interior angles of *any* triangle add to **180°**.

Quadrilateral angle sum

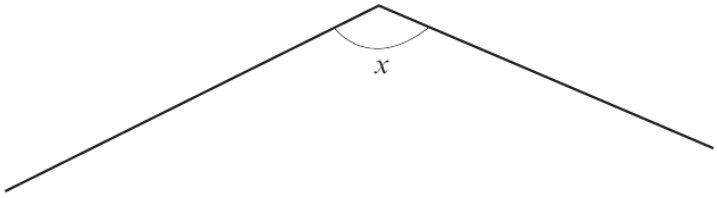
The four interior angles of *any* quadrilateral add to **360°**.

Common traps

- Forgetting that vertically opposite angles are equal — treat the diagram, not the look.
- Adding to 360° on a line instead of 180°.
- Missing the equal pair in an isosceles triangle.

Examiner only

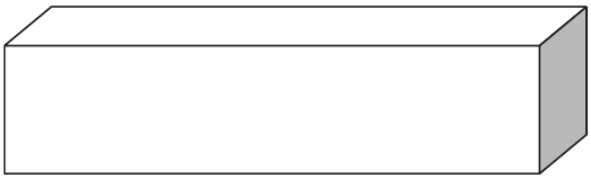
4. *(a)*



What type of angle is x in the diagram above?
Circle your answer. [1]

right angle reflex obtuse acute

(b)

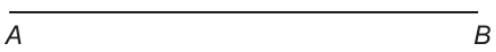


What is the special name of the shape drawn above?
Circle your answer. [1]

sphere cube cone cuboid cylinder

Examiner only

15. Construct an accurate drawing of triangle ABC, where $AB = 7$ cm, $A\hat{B}C = 90°$ and $B\hat{A}C = 60°$.
Use only a ruler and a pair of compasses.
The side AB has been drawn for you.
You must show your construction arcs. [3]



Examiner only

16. Calculate the length of the side *QR* in the triangle *PQR* shown below. [3]

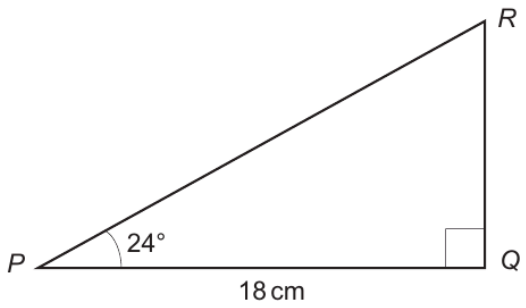


Diagram not drawn to scale

Examiner only

19. *ABCDE* is a regular pentagon with centre *O*.

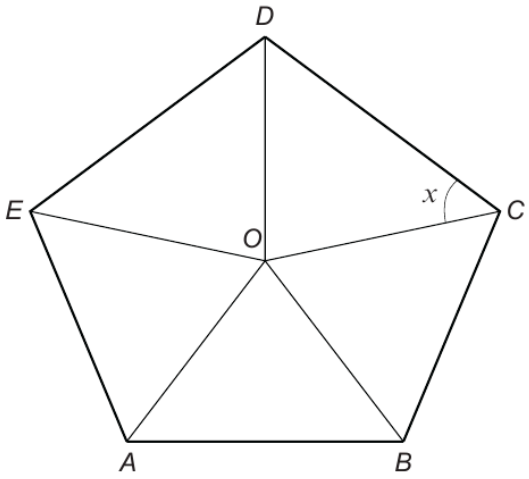


Diagram not drawn to scale

Calculate the size of angle x.
You must show all your working. [4]

Examiner only

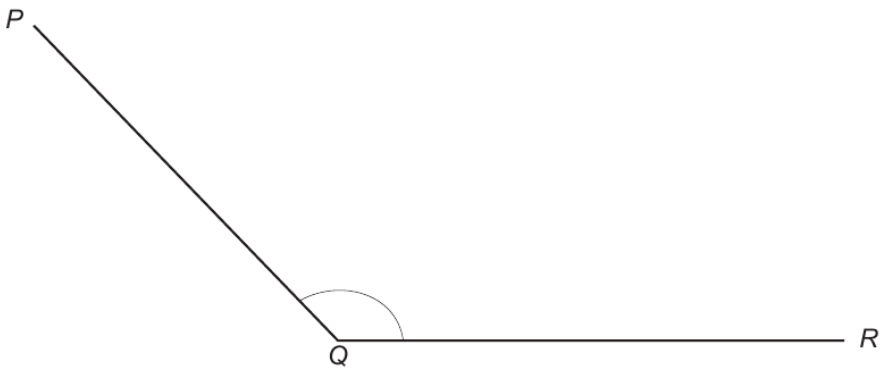
1. *(a)* Measure the length of the line *AB*.
Write your answer in centimetres. [1]

AB ..... cm

(b) In the space below, draw a circle with a radius of 6 cm. [1]

Examiner only

(c) Measure and write down the size of $P\hat{Q}R$. [1]



$P\hat{Q}R$ = ... °

Examiner only

1. Fill in the boxes below to make each calculation correct. [4]

£3.26	+	89p	=	£ .....
78p	+	£	=	£5.45
7	×	46p	=	£ .....
.....	×	25p	=	£9.75

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2. *(a)* Write 2453 correct to the nearest 10. [1]

.....

(b) Write in figures the number that is one less than ten thousand. [1]

.....

Examiner only

4. Which of the following fractions is nearest to $\frac{1}{4}$?

$\frac{1}{5}$ $\frac{7}{25}$ $\frac{13}{50}$

You must show all your working. [3]

Answer .....

5. Calculate **both** the area and the perimeter of a rectangle 6 cm long and 4·5 cm wide.

Use the answer spaces to clearly identify which is the area and which is the perimeter.
You must give the correct units for each of your answers. [4]

Area = ... Perimeter = ...

Examiner only

7. Find the value of each of the following.

(a) $2{\cdot}6^2$ [1]

(b) $\sqrt{21{\cdot}16}$ [1]

8.

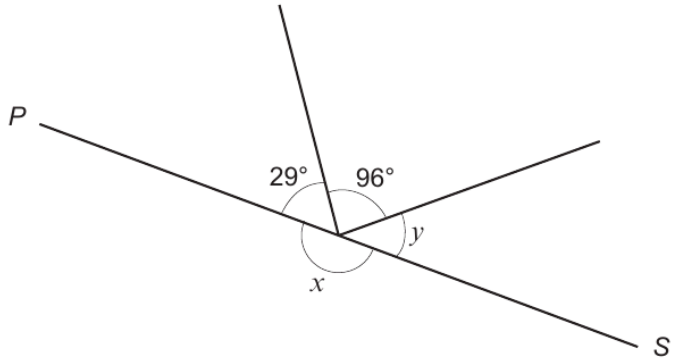


Diagram not drawn to scale

PS is a straight line.

(a) Write down the size of angle x. [1]

(b) Find the size of angle y. [2]

Examiner only

11. *(a)* Calculate $\frac{145{\cdot}3}{(12{\cdot}4 - 9{\cdot}8)^3}$, giving your answer correct to 3 significant figures. [2]

(b) Calculate the reciprocal of 47, giving your answer correct to 4 decimal places. [2]

12. Circle the correct answer in each of the following.

(a) Which of the following values **cannot** be an external angle of a regular polygon? [1]

10° 18° 30° 48° 72°

(b) An arrow on a spinner is facing north.
It is turned clockwise through an angle of 1530°.
In which direction will the arrow now be facing? [1]

North East South West None of these

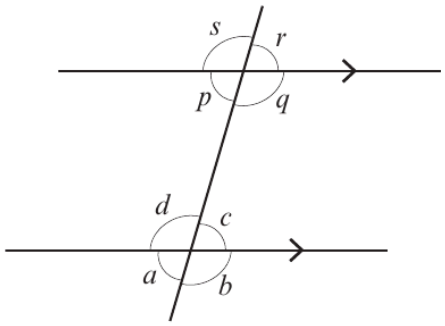
(c) Point *A* is on a bearing of 100° from point *B*.
What is the bearing of point *B* from point *A*? [1]

260° 100° 280° 180° 80°

Examiner only

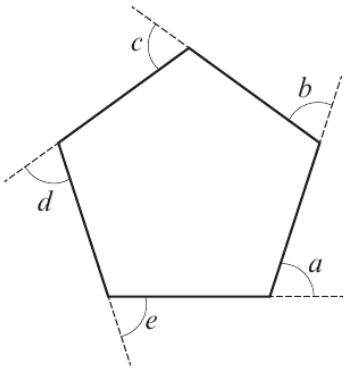
16. Circle the correct equation for each of the following.
All the lines shown are straight lines.

(a) [1]



$a + c + s + q = 360°$ $p + a = 180°$ $c = q$ $d = r$ $p + q + d + c = 180°$

(b) [1]

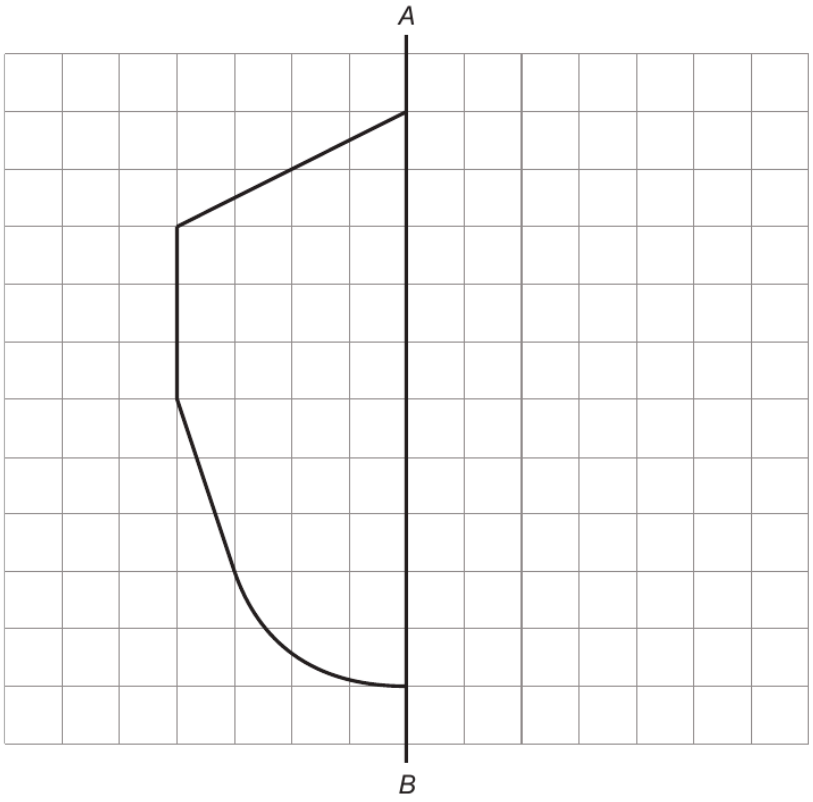


$\frac{a + b + c + d + e}{5} = 360°$ $a + b + c + d + e = \frac{360°}{5}$ $a + b + c + d + e = 180°$

$a + b + c + d + e = 540°$ $a + b + c + d + e = 360°$

Examiner only

5. *(a)* Complete the following figure so that it is symmetrical about the line AB. [2]



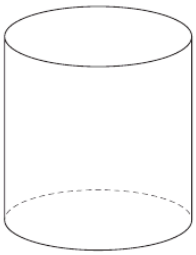
(b) Ben draws a shape that has:

- 4 sides,
- 4 angles of equal size,
- a pair of sides of length 4 cm, and
- a pair of sides of length 6 cm.

What type of shape has Ben drawn?
Circle the correct answer. [1]

square rhombus trapezium rectangle kite

(c) Write down the special name for the shape below. [1]



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Examiner only

8.

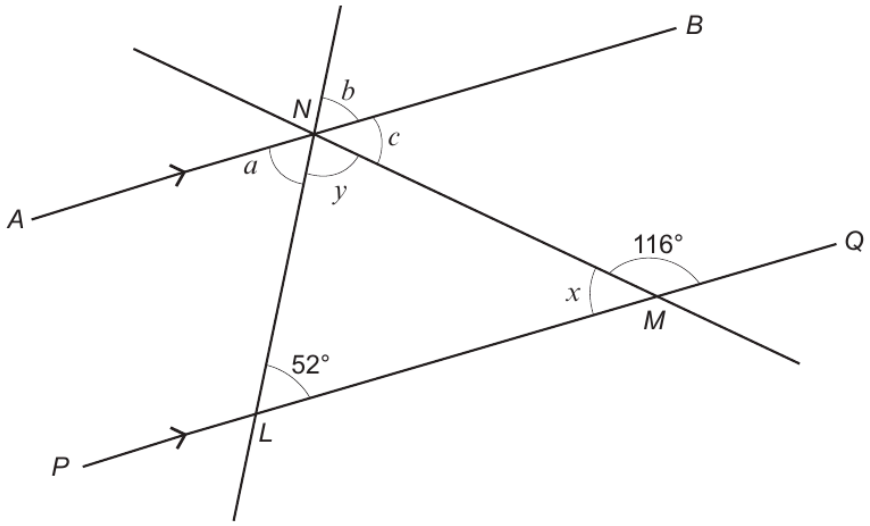

Diagram not drawn to scale

Line *AB* is parallel to line *PQ*.

(a) Find the size of each of the angles a, b and c. [3]

.....

.....

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.....

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a = ... ° b = ... ° c = ... °

Examiner only

(b) Find the size of each of the angles x and y.
Hence give the special name for triangle *LMN*. [3]

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.....

.....

x = ... ° y = ... °

The special name for triangle *LMN* is .....

Examiner only

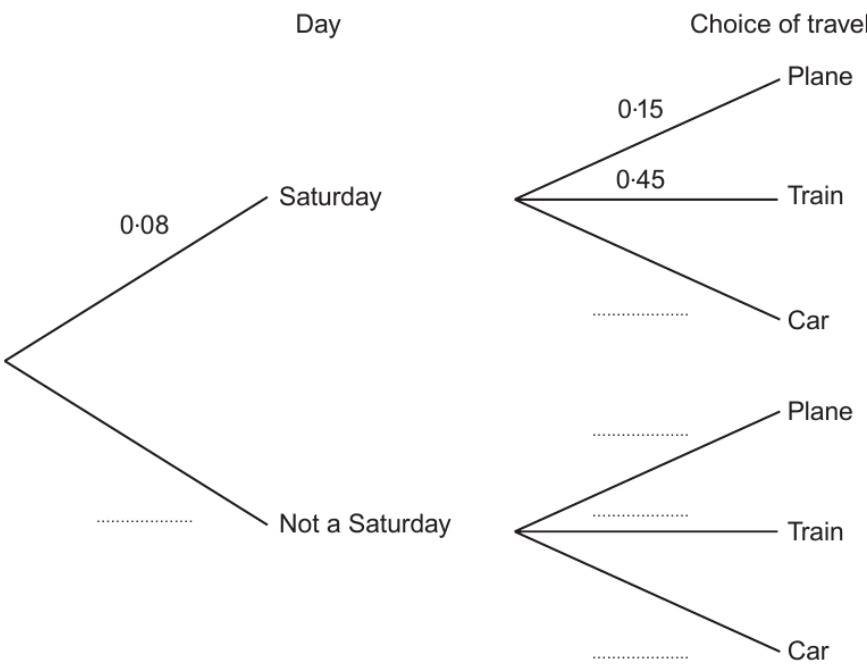
17. Alwena regularly travels from Anglesey to Cardiff to attend meetings.
For each meeting, she chooses one of three ways to travel: by plane, train or car.

The probability of a meeting being held on a Saturday is 0·08.

The probability that Alwena travels by plane to a meeting is 0·15.
The probability that she travels by train is 0·45.

Her decision on how to travel is independent of the day on which the meeting is held.

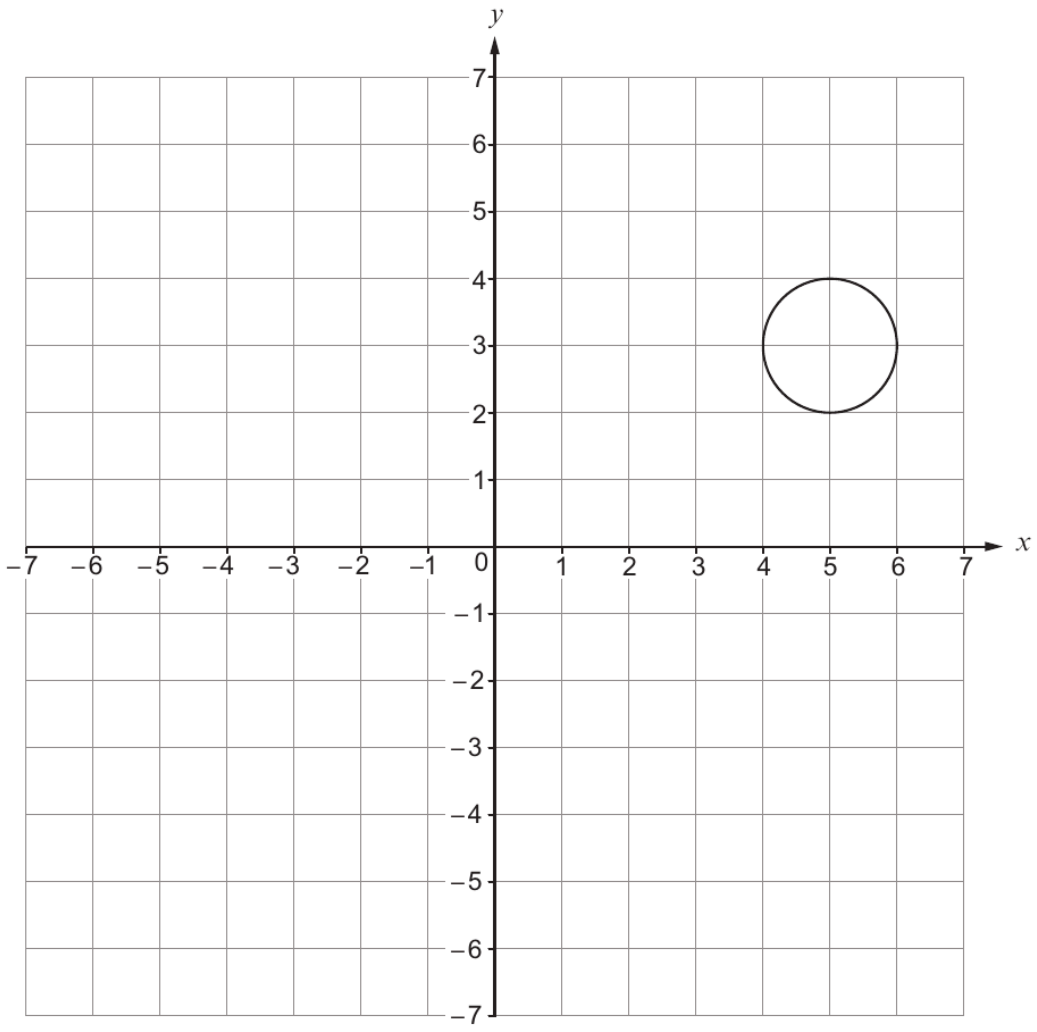
(a) Complete the following tree diagram. [3]



(b) A meeting is chosen at random.
Calculate the probability that the meeting is held on a Saturday and that Alwena travels by plane or by car. [3]

Examiner only

20. The circle shown below is rotated 90° anticlockwise about the origin.



What are the coordinates of the centre of the circle at its new position?
Circle the correct answer. [1]

(3, −5) (−5, −3) (−3, −5) (−3, 5) (3, 5)

Examiner only

21.

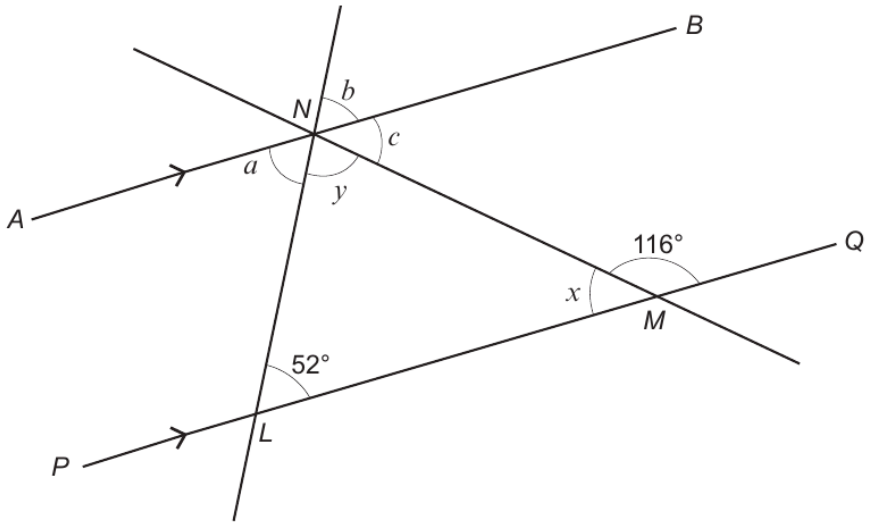


Diagram not drawn to scale

Line *AB* is parallel to line *PQ*.

(a) Find the size of each of the angles a, b and c. [3]

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a = ... ° b = ... ° c = ... °

Examiner only

(b) Find the size of each of the angles x and y.
Hence give the special name for triangle *LMN*. [3]

.....

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.....

.....

x = ... ° y = ... °

The special name for triangle *LMN* is .....

END OF PAPER

Examiner only

3. *(a)* Write down the first 3 multiples of 47. [1]

(b) One of the numbers below is a factor of 676.
Circle the correct number. [1]

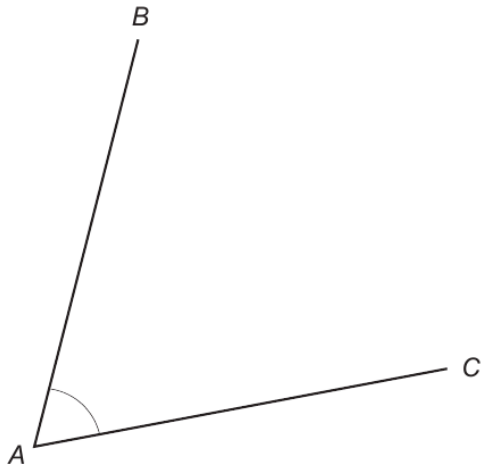
22 32 42 52 62

(c) When one of the numbers below is divided by 22, there is a remainder of 11.
Circle the correct number. [1]

208 209 210 211 212

Examiner only

8. *(a)* Measure $B\hat{A}C$. [1]



$B\hat{A}C$ = ... °

(b) One of the angles below is a reflex angle.
Circle the correct answer. [1]

45° 90° 135° 180° 225°

(c) The diagram below shows two angles on a straight line.
The large angle is 5 times the size of the small angle.
Find the size of each angle. [2]

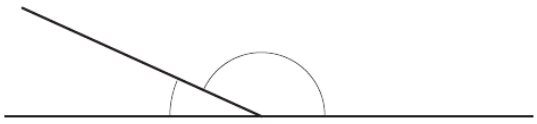


Diagram not drawn to scale

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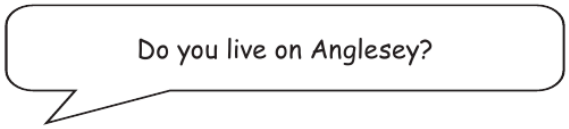
Small angle = ... ° Large angle = ... °

Examiner only

15. The Anglesey Show is a two-day event held every August.

(a) On the first day, a random sample of 2000 visitors at the show were asked:



640 of them answered 'Yes'.

What was the relative frequency of those who answered 'Yes'?
Give your answer as a decimal. [1]

(b) On the second day a random sample of 3000 visitors at the show were asked the same question.
The relative frequency of those who answered 'Yes' on this day was 0·42.

Calculate the relative frequency of those who said they lived on Anglesey when the samples for **both** days were combined.
Give your answer as a decimal. [4]

(c) Which of the following is most likely to give the best estimate for the relative frequency of visitors to the show living on Anglesey?
Circle your answer.

Your answer to part *(a)*	0·42	Your answer to part *(b)*

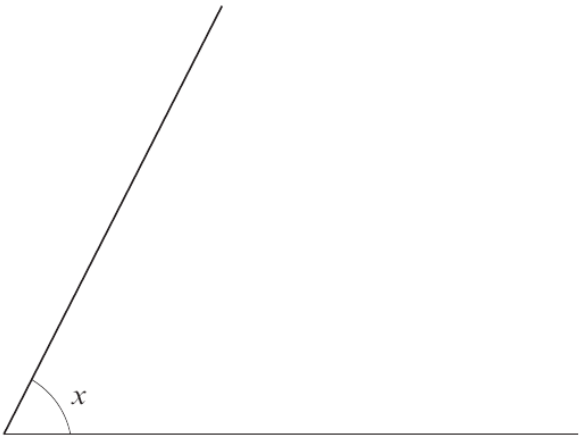
You **must** give an explanation for your choice. [1]

Examiner only

1. *(a)* On the line below, mark the point *B*, so that *AB* = 7·5 cm. [1]

A ——————————————————————

(b) Measure and write down the size of angle x. [1]



x = ... °

Examiner only

2.

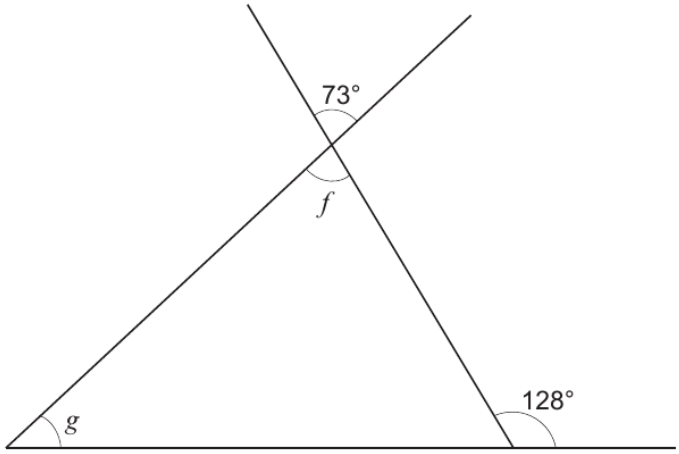


Diagram not drawn to scale

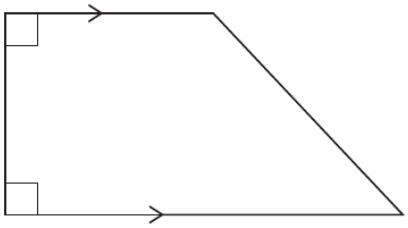
Calculate the size of each of the angles f and g. [3]

f = ... ° g = ... °

Examiner only

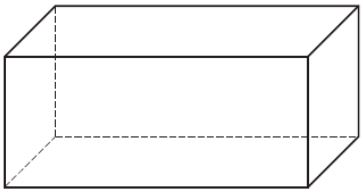
7. Circle the correct answer for each question below.

(a) What is the special name of the shape below? [1]



pentagon rhombus trapezium rectangle kite

(b) What is the special name of the 3D shape below? [1]



cube cuboid cylinder cone sphere

(c) What type of angle is an angle of 181°? [1]

an acute angle | an obtuse angle | a straight line | a right angle | a reflex angle

(d) Which shape has rotational symmetry of order 2? [1]

parallelogram | square | equilateral triangle | isosceles triangle | scalene triangle

Examiner only

8. *(a)* Solve the following equations.

(i) $\frac{x}{9} = 4$ [1]

(ii) $4(3x + 2) = 12$ [3]

(b) Factorise each of the following.

(i) $14a + 21$ [1]

(ii) $f^2 - f$ [1]

Examiner only

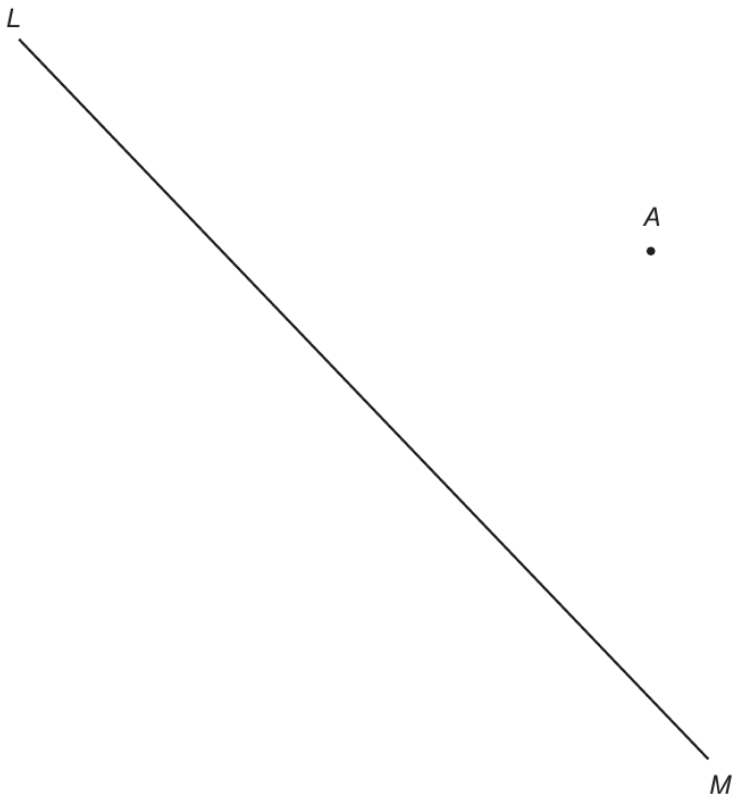
16. *(a)* Using only a ruler and a pair of compasses, construct a triangle PQR, so that it satisfies **both** of the following conditions:

- $P\hat{Q}R = 60°$,
- $PQ = 7\,\text{cm}$.

Side QR has been drawn for you. [2]

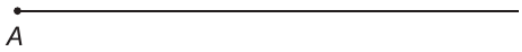
Examiner only

(b) Using only a ruler and a pair of compasses, construct a line from the point *A* that is perpendicular to the line *LM*. [2]



Examiner only

1. *(a)* Draw an angle of 35° at point *A*. [1]



(b) In the space below, draw a circle with a diameter of 14 cm.
The centre of the circle is marked ● below. [1]

Examiner only

5. In this question, you must complete the boxes using **only** the digits 0, 1 and 2.
In each part, you must use **all three** of the digits.

(a) Write the size of an angle which is an obtuse angle. [1]

			°

(b) Write the size of an angle which is a reflex angle. [1]

			°

6. Kate writes down three **different even** numbers.

The mean of Kate's numbers is 8.
She did **not** write down the number 8.

What possible even numbers could Kate have written down? [3]

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.....

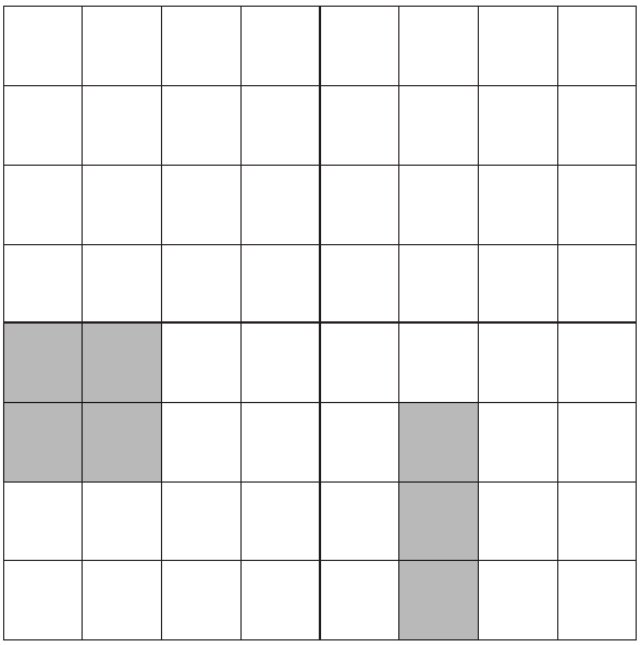
.....

.....

Possible numbers Kate could have written are ..... , ... and .....

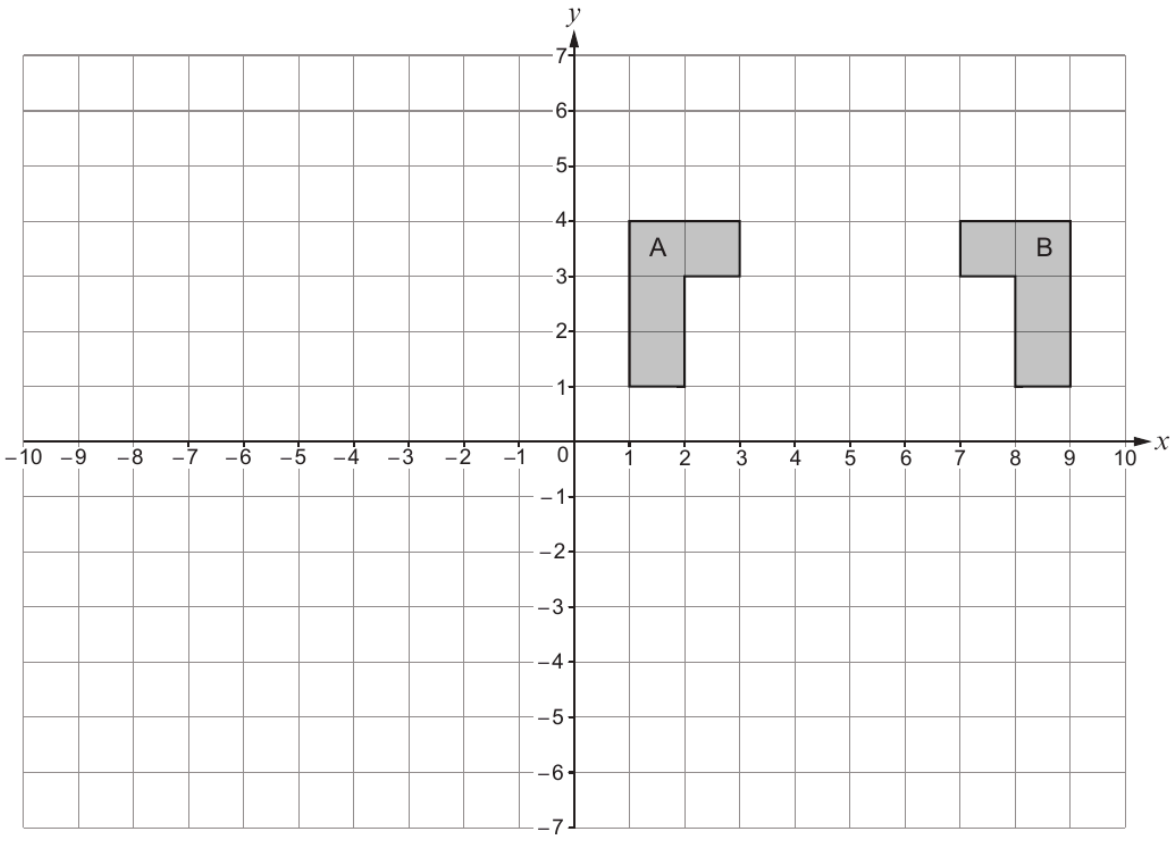
Examiner only

5. *(a)* Shade the least number of squares so that the grid has rotational symmetry of order 2. The squares you shade must be in the upper two quadrants. [2]



Examiner only

(b) Describe fully the **single** transformation that transforms shape A onto shape B. [2]



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Examiner only

5. *(a)* Solve the equation $4x + 7 = 10$. [2]

(b) Simplify $8d - 6e - 3d + 4e$. [2]

6. *PQ* and *RS* are parallel.

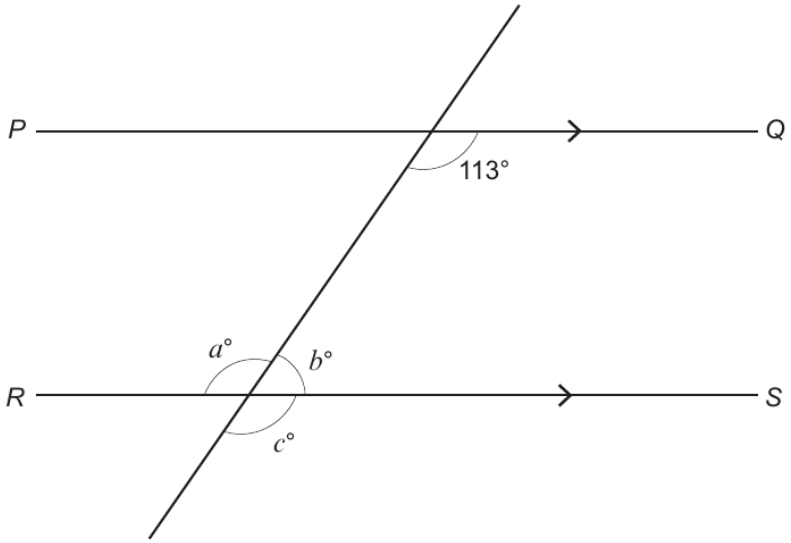


Diagram not drawn to scale

Find the values of a, b and c. [3]

$a =$ ..... $b =$ ..... $c =$ .....

Examiner only

11. The diagram shows two right-angled triangles, joined together along a common side.
$AB = 10{\cdot}8\,\text{cm}$, $BC = 14{\cdot}4\,\text{cm}$ and $CD = 24\,\text{cm}$.

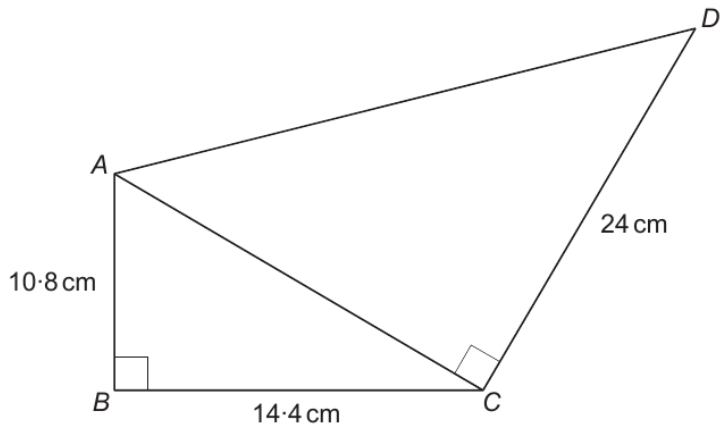


Diagram not drawn to scale

Calculate the area of triangle ACD.
You must show all your working. [5]

Examiner only

15. *(a)* Is it possible for an isosceles triangle to have an angle of 140°?
Circle your answer.
You **must** give an explanation for your answer. [1]

YES NO

.....

.....

.....

.....

(b)

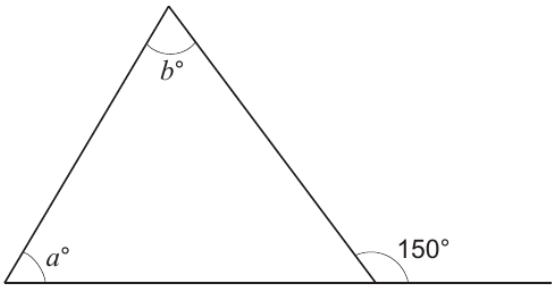


Diagram not drawn to scale

Which of the following equations is correct for the diagram shown above?
Circle your answer. [1]

$a + b = 30$ $a + b = 210$ $b - a = 150$

$a - b = 150$ $a + b = 150$

Examiner only

17. *PQ* and *RS* are parallel.

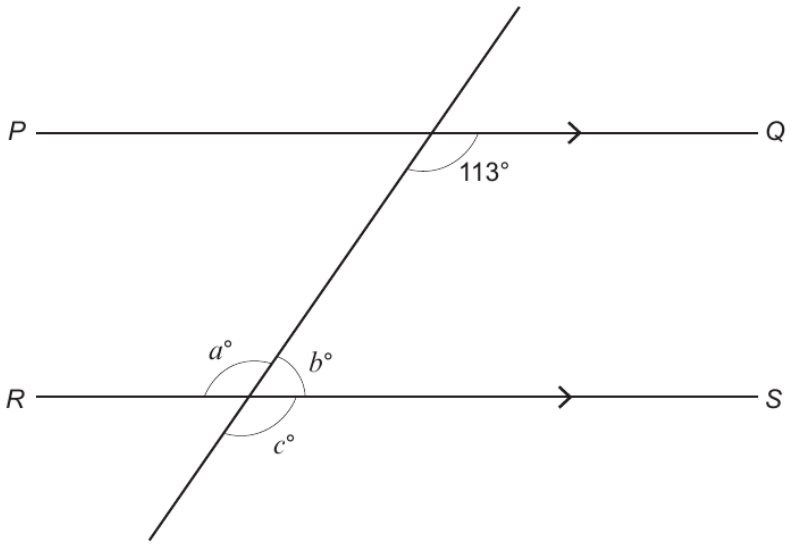


Diagram not drawn to scale

Find the values of a, b and c. [3]

.....

.....

.....

.....

a = ... b = ... c = ...

Examiner only

16. Calculate the value of $(3{\cdot}2 \times 10^{7}) \times (8{\cdot}3 \times 10^{-2})$.
Give your answer in standard form. [2]

17. The lengths of the sides of a rectangle are given as 24 cm and 15 cm.
Each measurement is given correct to the nearest centimetre.

Calculate the difference between the greatest possible perimeter of the rectangle and the least possible perimeter of the rectangle. [3]

Examiner only

18. A circle, centre O, has a radius of 4 cm.
A and B are points on the circumference of the circle.
Lines PA and PB are both tangents to the circle.
PB = 12 cm.

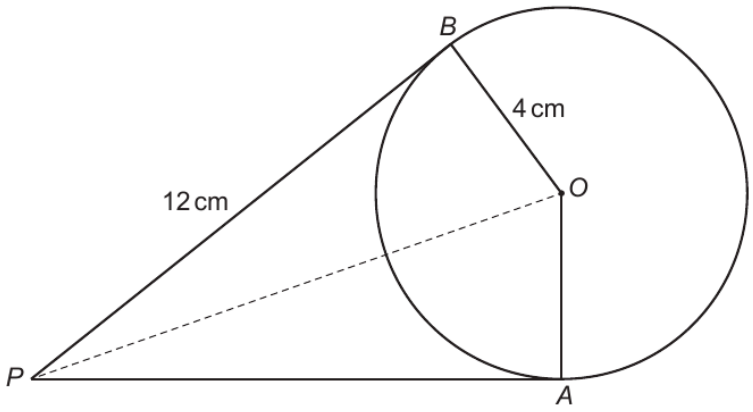


Diagram not drawn to scale

(a) What is the length of PA?
State the circle theorem you have used to find your answer. [1]

PA = ...

Circle theorem: .....

.....

(b) What is the size of $\hat{PAO}$?
State the circle theorem you have used to find your answer. [1]

$\hat{PAO}$ = ...

Circle theorem: .....

.....

(c) Calculate the area of the quadrilateral $PAOB$. [2]

.....

.....

.....

.....

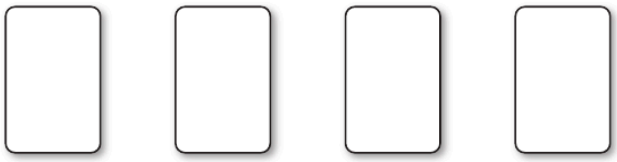
.....

Examiner only

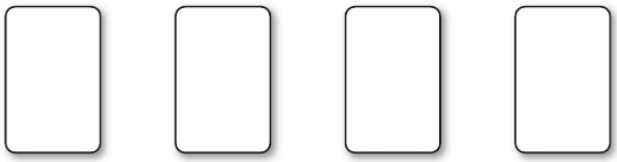
2. A card is chosen at random from a set of four cards.

In each question, **write numbers on the four cards** to make each of the following statements true.

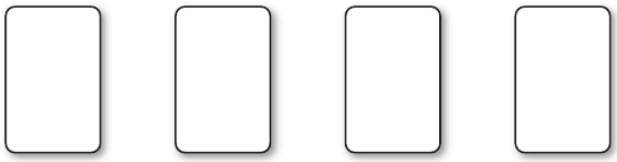
(a) It is certain that the chosen card will be a 5. [1]



(b) It is an even chance that the chosen card will be a 3. [1]



(c) It is unlikely that the chosen card will be a 2. [1]



3. *(a)* Write forty thousand and sixty-five in figures. [1]

.....

(b) Round 5378 to the nearest hundred. [1]

.....

Examiner only

9. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

A rectangle has length 15 cm and width 7 cm.
A square has the same perimeter as this rectangle.

Calculate the length of a side of the square.
You must show all your working. [4 + 2 OCW]

Examiner only

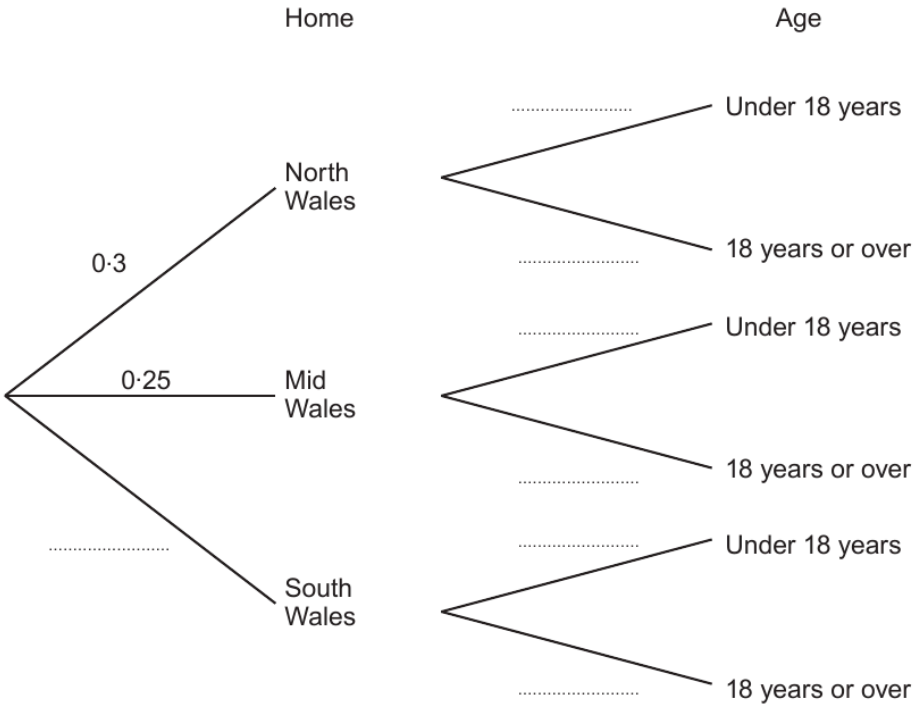
16. A group of people have put their names forward to carry the Welsh flag at a sporting event. Each person lives in North Wales, Mid Wales or South Wales.

One person from the group is chosen at random.
The probability of choosing a person who lives in North Wales is 0·3.
The probability of choosing a person who lives in Mid Wales is 0·25.

The probability of choosing a person who is under 18 years old is 0·2.

The people's ages are independent of where they live.

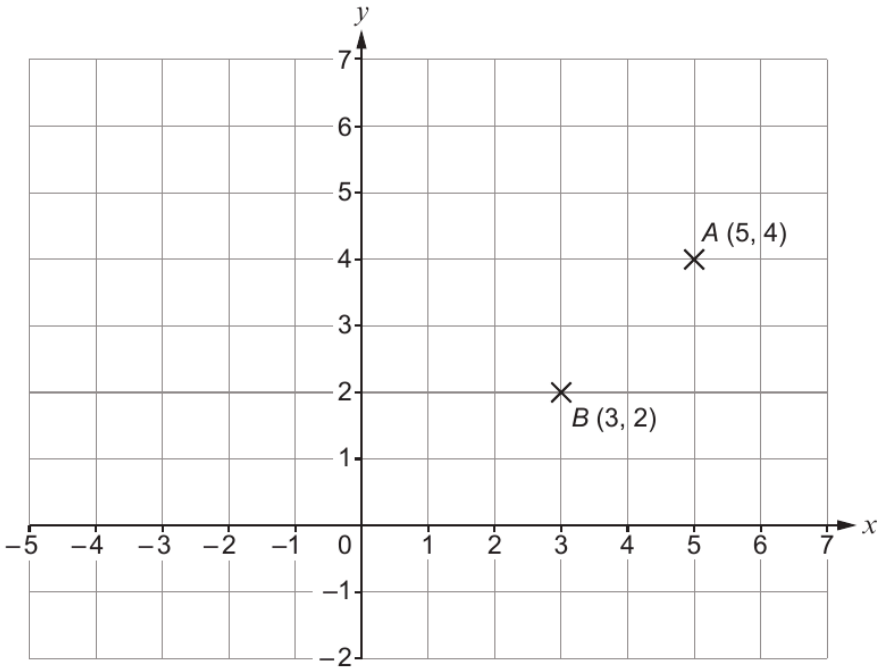
(a) Complete the tree diagram shown below. [3]



(b) What is the probability of choosing a person who lives in South Wales and is under 18 years old? [2]

Examiner only

2.



(a) *B* is the midpoint of the line *AC*.
Find the coordinates of *C*. [2]

.....

.....

C (..... , ...)

(b) *A* and *B* are two vertices of a right-angled triangle.
Point *D* is to be plotted on the grid above so that the triangle *ABD* is a right-angled triangle.
The x-coordinate of *D* is negative.
Give the coordinates of a possible position of the point *D* that can be plotted on the grid above. [2]

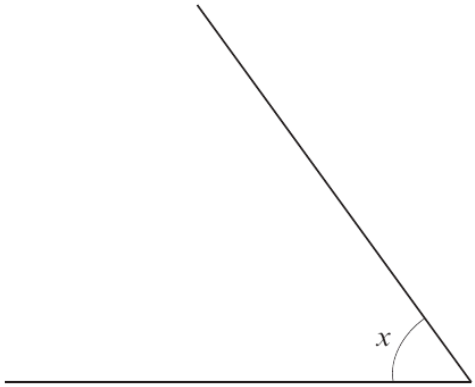
.....

.....

D (..... , ...)

Examiner only

4. (a) Measure and write down the size of angle x. [1]



x = ... °

(b)

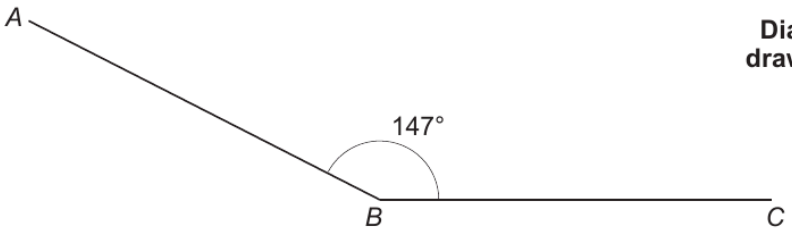


Diagram not drawn to scale

In the space below, draw $A\hat{B}C = 147°$ accurately.

The line BC has been drawn for you. [1]

Examiner only

5. (a) Elaine writes down two square numbers.

She subtracts the smaller square number from the larger square number.
Her answer is 9.

Which two square numbers did Elaine write down? [2]

.....

.....

.....

Elaine's square numbers are ..... and .....

(b) Dylan adds two odd numbers together and gets an answer of 37.

Could Dylan's answer be correct?

Yes ☐ No ☐ Can't tell ☐

Explain your reasoning. [1]

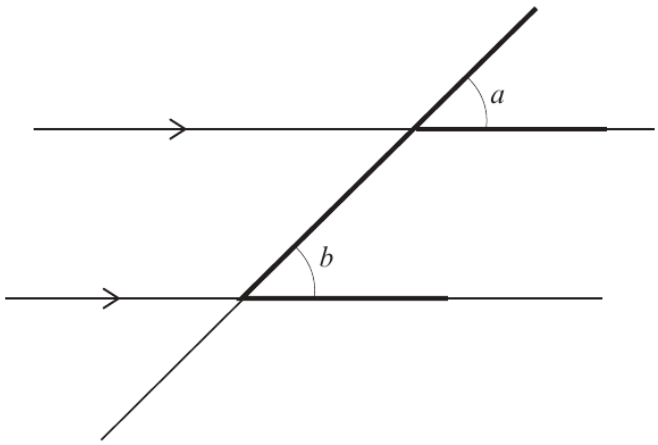
Reasoning: .....

.....

.....

Examiner only

8. What is the correct name for the relationship between angle a and angle b in the diagram?
Circle your answer. [1]



corresponding angles | alternate angles | interior angles | parallel angles | opposite angles

9. A car travels 129·5 miles in 3 hours 30 minutes.
Calculate the average speed of the car.
Give your answer in miles per hour. [3]

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.....

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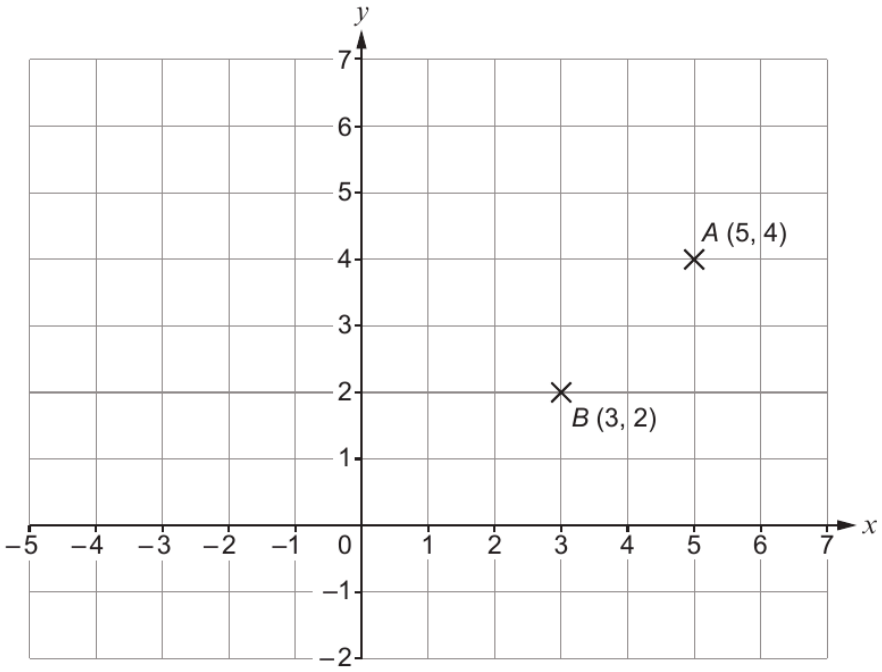
Examiner only

12.



(a) *B* is the midpoint of the line *AC*.
Find the coordinates of *C*. [2]

.....

.....

C (..... , ...)

(b) *A* and *B* are two vertices of a right-angled triangle.
Point *D* is to be plotted on the grid above so that the triangle *ABD* is a right-angled triangle.
The x-coordinate of *D* is negative.
Give the coordinates of a possible position of the point *D* that can be plotted on the grid above. [2]

.....

.....

D (..... , ...)

Examiner only

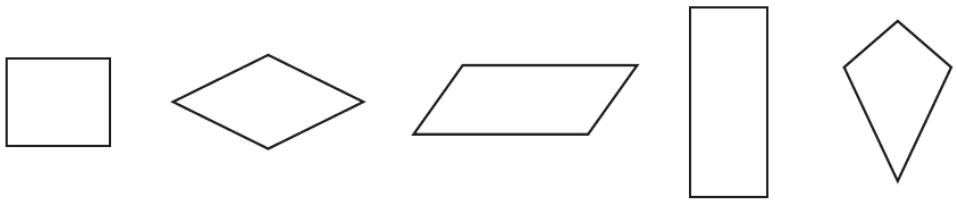
12. (a) Factorise $8x^2 + 6xy$. [2]

(b) (i) Factorise $x^2 + 13x + 40$. [2]

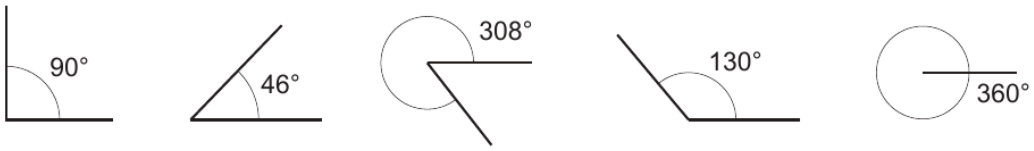
(ii) Explain how you can check that your answer to part (i) is correct. [1]

Examiner only

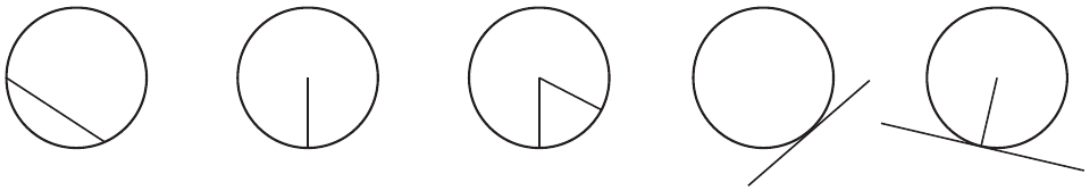
2. (a) The special name for one of the quadrilaterals below is a kite.
Circle the kite. [1]



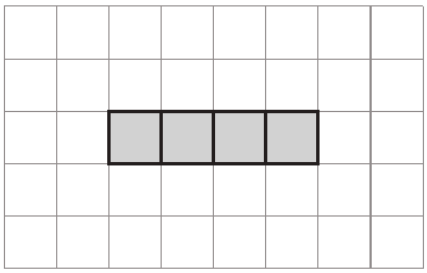
(b) One of the angles shown below is an acute angle.
Circle the acute angle. [1]



(c) One of the diagrams below shows a chord of a circle.
Circle the correct diagram. [1]



(d) Add two squares to the four shaded squares shown below so that the complete diagram forms the net of a cube. [1]



Examiner only

2. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Mrs Smith is planning to hold a tea party in her garden.

The costs for the party are shown in the table below.

Item	Cost
36 scones	52 pence each
4 pots of cream	£1.27 per pot
3 jars of strawberry jam	£2.16 per jar
9 plates of sandwiches	£7.98 per plate
Drinks and decorations	£230

Mrs Smith has already saved £250 towards the cost of the party.

How much more money does Mrs Smith need for the party?
You must show all your working. [6 + 2 OCW]

Examiner only

(b) Mrs Smith wants to make her own bunting to decorate the garden.

The triangles for the bunting are in the shape of isosceles triangles.

A sketch of the pattern that Mrs Smith is going to use to make her bunting is shown below.

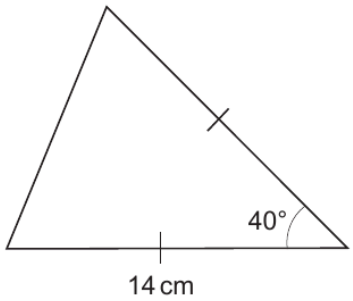


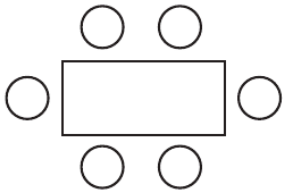
Diagram not drawn to scale

Make an accurate drawing of the pattern for the bunting.
One side has already been drawn for you. [3]

Examiner only

(c) Mrs Smith is planning to use a number of identical rectangular tables for her party. There will be 18 people at the party, including Mrs Smith.

Six chairs fit around one table, as shown in the diagram below.



She would like all the tables to be joined together.

All the tables must be joined together either:

- with their shorter sides touching
  or
- with their longer sides touching.

Mrs Smith wants to use the **least number of tables** possible.
Draw a diagram in the space below to show how the tables and chairs for the 18 people at the party should be arranged. [2]

Examiner only

2. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Iwan recorded his gas usage for a week.
His meter reading was 21 345 kWh at the start of the week.
His meter reading was 21 640 kWh at the end of the week.

Gas costs 7.2p per kWh.
VAT at 5% is payable on the cost of any gas used.

Calculate the total cost of Iwan's gas for the week.
You must show all your working. [5 + 2 OCW]

Examiner only

(b) For the first 7 days of October, the mean daily outside temperature at midday where Iwan lives was 13·2°C.
The temperatures at midday for the next 2 days of October were 12·2°C and 12·4°C.

Calculate the total of the temperatures for the first 7 days.
Hence, calculate the mean midday temperature for the first 9 days of October.
You must show all your working. [4]

The mean midday temperature for the first 9 days of October was ..... °C

(c) The plan of the streets where Iwan lives is shown below.

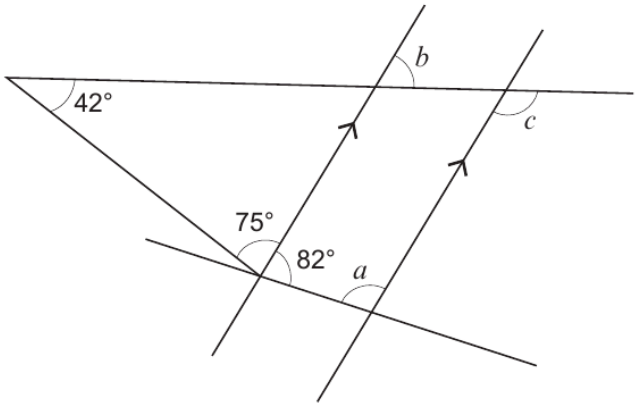


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

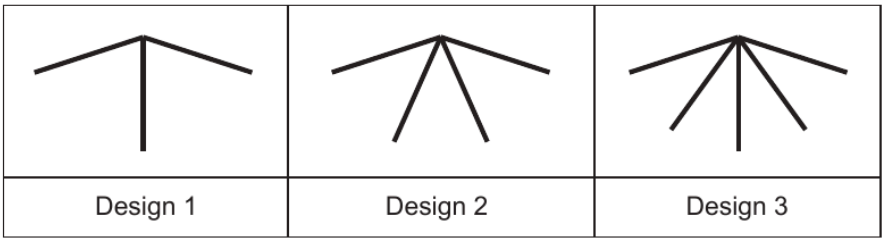
a = ... ° b = ... ° c = ... °

Examiner only

4. A jewellery designer makes brooches.
Each brooch consists of a number of identical pieces of metal.

These brooches come in different designs.
These designs follow a simple pattern.

The first three designs are shown below.
Design 1 consists of 3 pieces of metal.



Design 1	Design 2	Design 3

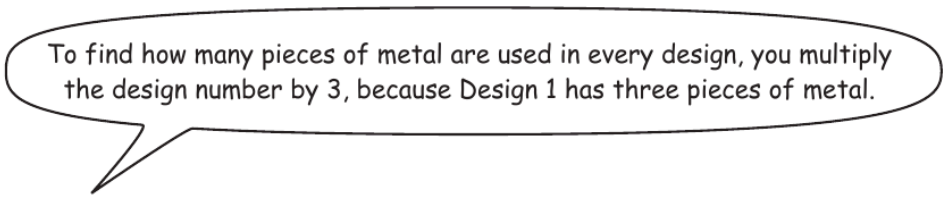
(a) How many pieces of metal will be used to make the brooch in Design 5? [1]

.....

(b) Which design uses 11 pieces of metal? [1]

.....

(c) A customer says,



Is the customer correct for every design?

Yes ☐ No ☐

Give a reason for your answer. [1]

.....

.....

.....

.....

Examiner only

(d) One customer decides to order a special brooch with a horizontal bar at the top.

The designer knows two of the angles. These are shown in the diagram below.

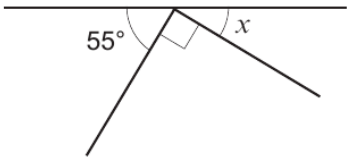


Diagram not drawn to scale

Calculate the size of angle x. [2]

.....

.....

$x =$ ..... °

(e) The designer uses the following formula to calculate how much he will charge for a brooch.

Charge for a brooch (in £) = 2 × cost of materials + 14

A customer spends £30 on a brooch for a friend.

Calculate the cost of the materials for this brooch. [2]

.....

.....

.....

.....

Cost of materials is £ .....

Examiner only

5. (a) Iwan recorded his gas usage for a week.
His meter reading was 21 345 kWh at the start of the week.
His meter reading was 21 640 kWh at the end of the week.

Gas costs 7.2p per kWh.
VAT at 5% is payable on the cost of any gas used.

Calculate the total cost of Iwan's gas for the week.
You must show all your working. [5]

Examiner only

(b) For the first 7 days of October, the mean daily outside temperature at midday where Iwan lives was 13·2°C.
The temperatures at midday for the next 2 days of October were 12·2°C and 12·4°C.

Calculate the total of the temperatures for the first 7 days.
Hence, calculate the mean midday temperature for the first 9 days of October.
You must show all your working. [4]

The mean midday temperature for the first 9 days of October was ..... °C

(c) The plan of the streets where Iwan lives is shown below.

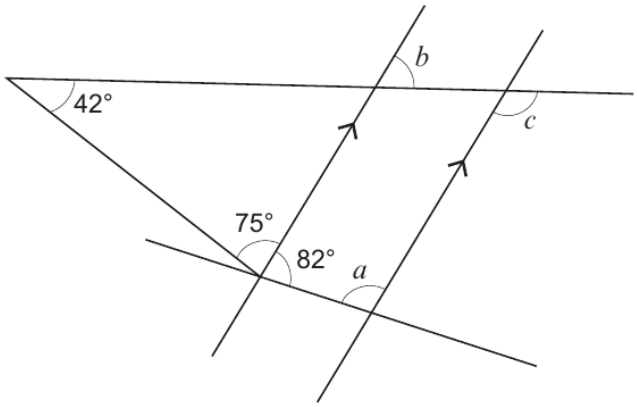


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

a = ... ° b = ... ° c = ... °

Examiner only

(b) $18 - p = 6$ [1]

.....

.....

.....

11. Use a ruler and a protractor to make an accurate drawing of this triangle in the space below. [3]

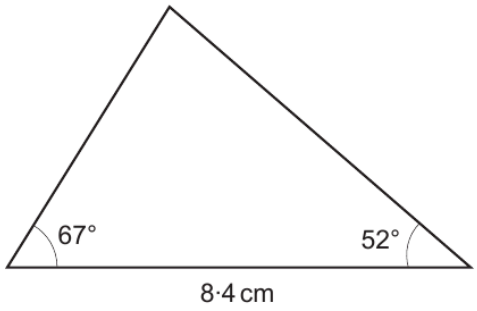
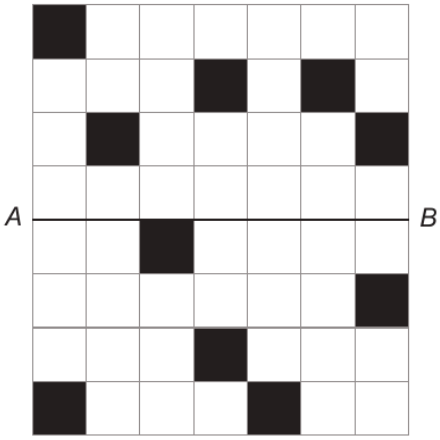


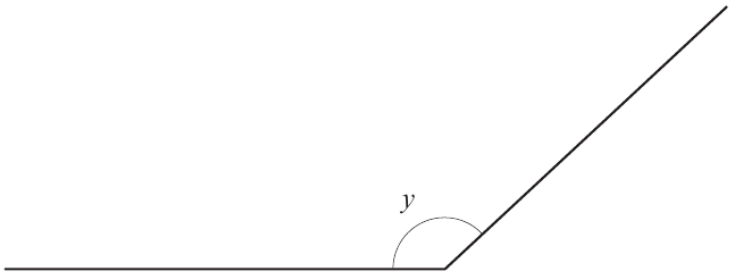
Diagram not drawn to scale

Examiner only

2. Shade the smallest number of squares needed to make *AB* a line of symmetry. [2]

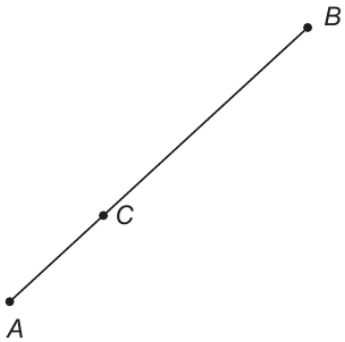


3. (a) Measure and write down the size of angle y. [1]



y = ... °

(b) Draw a line through the point *C* that is perpendicular to *AB*. [1]



Examiner only

6. The mean of four numbers is 7.

(a) What is the total of the four numbers? [1]

.....

.....

(b) Find a set of four numbers such that:

- their mean is 7
- their range is 6.

Write your four numbers in the boxes below. [2]

.....

.....

.....

.....

7.

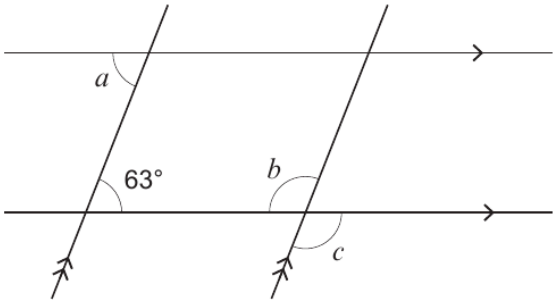


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

.....

a = ... ° b = ... ° c = ... °

Examiner only

7. (a) What is the special name given to an angle greater than 0° and less than 90°? [1]

(b) What is the special name of a quadrilateral with rotational symmetry of order four? [1]

8. (a) Describe **in words** the rule for continuing each of the following sequences.

(i) 62, 51, 40, 29, … [1]

Rule:

(ii) 2, 8, 32, 128, … [1]

Rule:

(b) Solve the following equations.

(i) $4x = 124$ [1]

(ii) $w + 6{\cdot}9 = 110$ [1]

9. (a) Calculate $\frac{3}{8}$ of 142. [2]

Write your answer as a decimal.

Examiner only

11. (a)

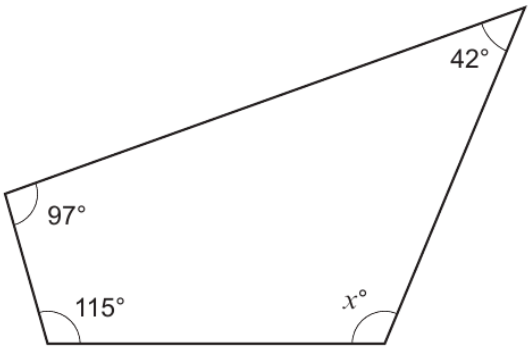


Diagram not drawn to scale

Calculate the value of x. [2]

(b) The diagram below shows an isosceles triangle.

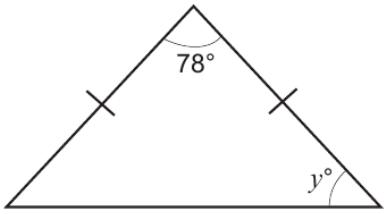


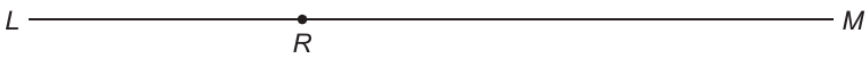
Diagram not drawn to scale

Calculate the value of y. [2]

Examiner only

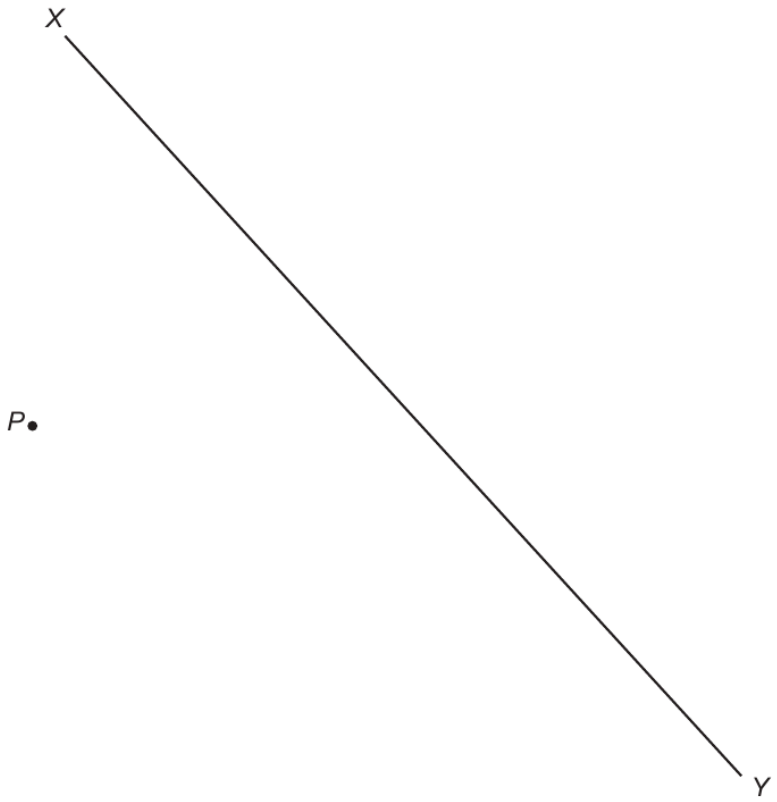
14. (a) Line *AB* is shown below.
Using only a ruler and a pair of compasses, construct an angle of 60° at point *B*. [1]

(b) *R* is a point on the line *LM*.
Using only a ruler and a pair of compasses, construct an angle of 90° at point *R*. [1]



Examiner only

(c) Using only a ruler and a pair of compasses, construct a perpendicular line from the point *P* to the line *XY*. [2]



Examiner only

15. The shape below consists of a semicircle attached to one side of a right-angled triangle.
$A\hat{B}C = 90°$, $AB = 8$ cm, $BC = 6$ cm.
BC is the diameter of the semicircle.

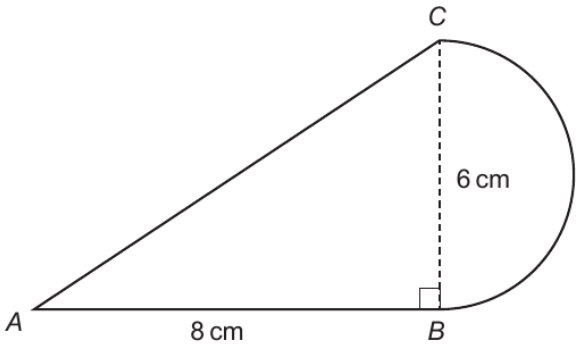


Diagram not drawn to scale

Calculate the perimeter of the shape.
Use $\pi = 3{\cdot}14$.
You must show all your working. [5]

Examiner only

17.

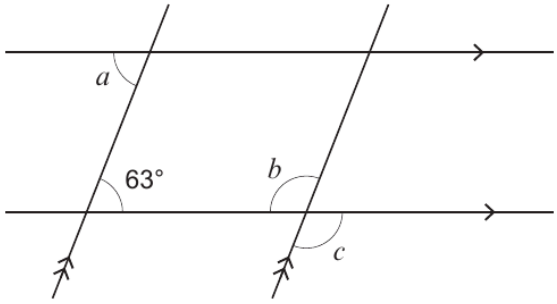


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

a = ... ° b = ... ° c = ... °

Examiner only

18. The diagram below shows a semicircle, with radius r, drawn inside a trapezium.

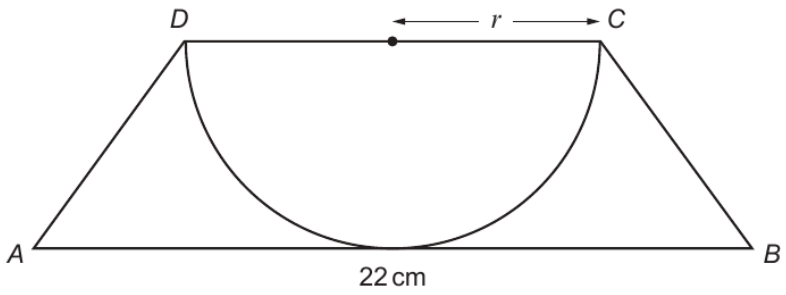


Diagram not drawn to scale

The area of the semicircle is $77\,\text{cm}^2$.

The semicircle touches the line AB.
$AB = 22\,\text{cm}$.

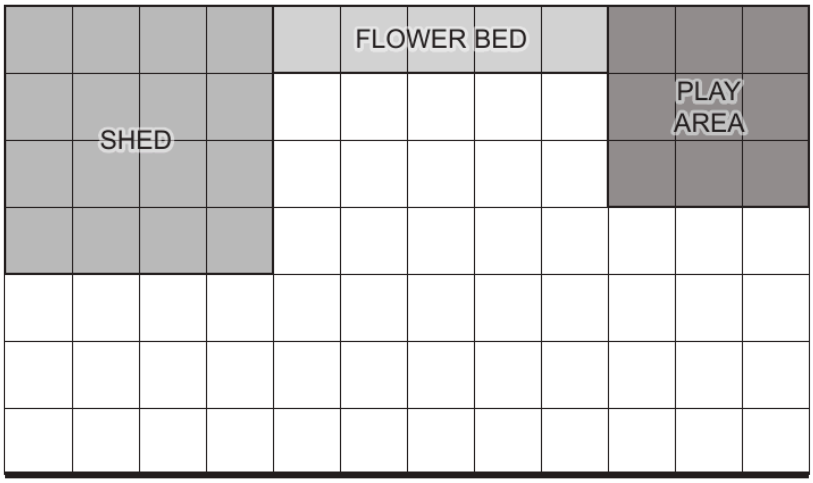
Calculate the area of the trapezium $ABCD$. [5]

END OF PAPER

Examiner only

1. The scale drawing below shows a plan of Amir's garden.
It shows the position of the shed, flower bed, play area and the back of the house.

Scale: 1 cm represents 1 m



BACK OF THE HOUSE

(a) Amir wants to put a hot tub in his garden.

The base of Amir's hot tub is rectangular.
It is 3 m long and 2 m wide.

(i) Amir wants the rectangular hot tub to be:
- at least 2 m from the back of the house
- at least 1 m from everything else.

Draw a possible position for the hot tub on the scale drawing above. [2]

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(ii) What is the area of the base of the hot tub?
Circle your answer. [1]

$6\,m^2$ $6\,m$ $5\,m^2$ $10\,m$ $10\,m^2$

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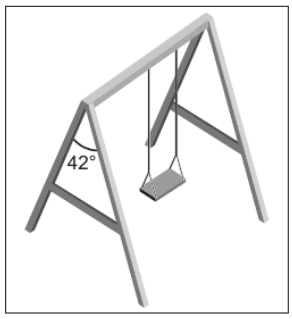
Examiner only

(b) Amir is building a swing for the play area.



The 2 long posts that meet at the top at each end of the swing need to be at an angle of 42°.

(i) What type of angle is 42°?
Circle your answer. [1]

an acute angle a right angle a straight line an obtuse angle a reflex angle

(ii) Amir is joining 2 long posts together.
One post is lying on horizontal ground.
Draw an angle of 42° at point T. [1]

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(iii) Each long post makes an angle of 69° with the horizontal ground.
The diagram below shows one of these posts.
Calculate the size of angle x. [2]

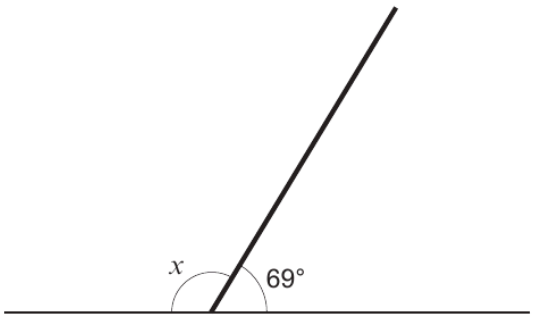

Diagram not drawn to scale

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Examiner only

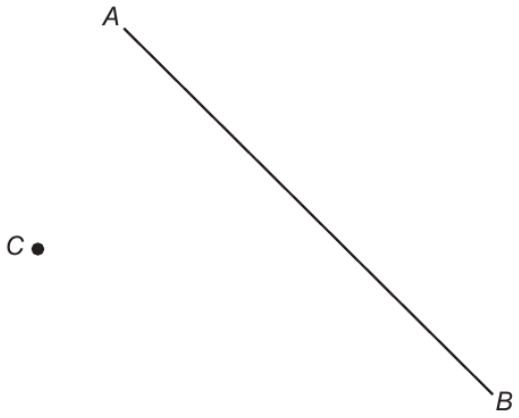
4. (a) (i) Which of these angles is the **largest acute** angle?
Circle your answer. [1]

175° 45° 355° 85° 95°

(ii) Which of these angles is the **smallest obtuse** angle?
Circle your answer. [1]

95° 75° 275° 105° 185°

(b) The line *AB* is shown below.



Draw a line, parallel to *AB*, through the point *C*. [1]

Examiner only

5. Treviso is a company that designs and builds bicycles.

(a) Treviso has designed this new bike frame.
The missing angles need to be calculated.

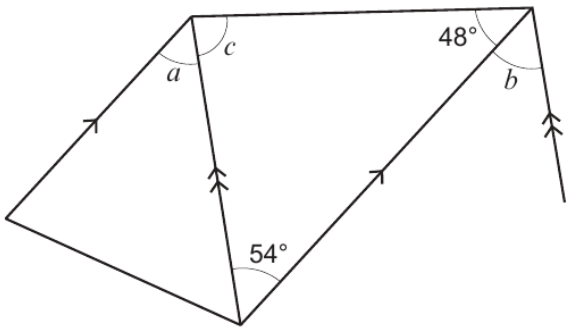


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [3]

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a = ... ° b = ... ° c = ... °

Examiner only

(b) Each wheel on Treviso's new bike has a diameter of 29 inches.

(i)

Remember:	1 foot = 12 inches

Ollie tests Treviso's new bike over a distance of 1000 feet.
How many times will a wheel rotate during the test? [4]

(ii)

Remember:	12 inches ≈ 30 cm

What is the diameter of each wheel in **millimetres**? [3]

Diameter is ..... mm

(c) Ollie uses the new bike in a 48 km race.
He completes the race in a time of 1 hour 30 minutes.
Calculate his average speed for the race.
Give your answer in km/h. [3]

Average speed is ..... km/h

Examiner only

9. (a) Maggie sees a Bluetooth speaker in a sale.

The price of the speaker is reduced by 18% in the sale.
The original price of the speaker was £45.

Maggie's mum says she will share the cost of buying this speaker.
The ratio of the amount Maggie's mum pays to the amount Maggie pays is 8 : 1.

Calculate the amount Maggie's mum will pay towards buying this speaker in the sale.
You must show all your working. [4]

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Examiner only

(b) The diagram below shows a flowerbed at Maggie's house.
Maggie's mum will pay her £2.50 per m^2 to weed the flowerbed.

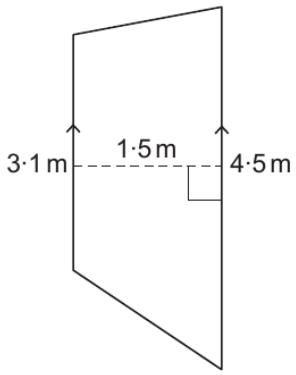

Diagram not drawn to scale

Calculate how much Maggie will get paid for the weeding. [4]

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Examiner only

17. The diagram below shows two shaded squares inside a larger square.

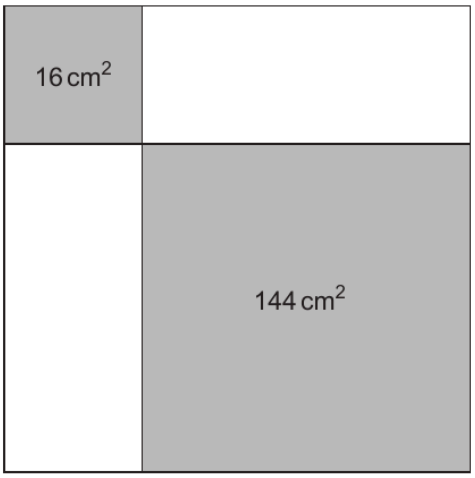

Diagram not drawn to scale

The diagram shows the area of each of the two shaded squares.

Calculate the **total** area of the two regions that have **not** been shaded.
You must show all your working. [5]

Examiner only

18. The points *B*, *C*, *D* and *E* lie on the circumference of a circle, with centre *O*.
AF is a tangent to the circle.
AO is a straight line.

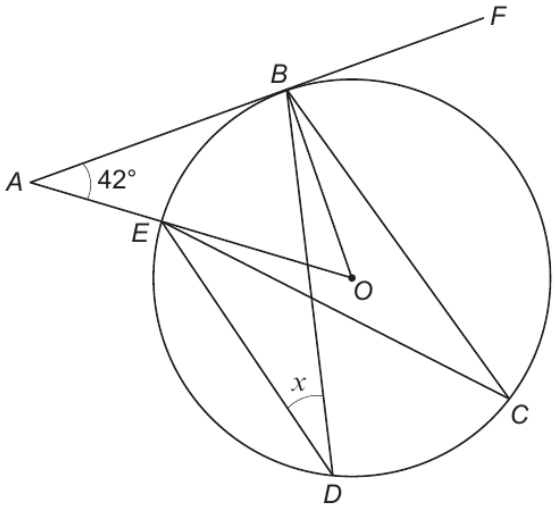

Diagram not drawn to scale

(a) Explain how you know that *AOB* is a right-angled triangle. [1]

(b) Calculate the size of angle x.
You must show all your working. [3]

Examiner only

1. Solve each of the following equations.

(a) $\frac{x}{5} = 20$ [1]

(b) $7m + 3 = 31$ [2]

2. (a) Evaluate 55% of 42·8. [2]

(b) Which one of the following is **not** equal to a recurring decimal?
Circle the correct answer. [1]

$\frac{2}{11}$ $\frac{2}{3}$ $\frac{3}{16}$ $\frac{7}{9}$ $\frac{5}{6}$

Examiner only

6. Erin owns a small shop.
Last year, Erin's income from her shop was 26 000 euros.
Erin had to pay tax on all of this income.
She paid 20% tax on the first 15 000 euros of this income.
She paid 30% tax on the rest of this income above 15 000 euros.

Calculate how much tax Erin paid in total.
You must show all your working. [5]

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Examiner only

11. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

The right-angled triangle ABC is a cross-section of a prism, as shown below.

$AB = 9\,\text{cm}$, $BC = 10\,\text{cm}$ and $A\hat{B}C = 90°$.
The length of the prism is 20 cm.

Calculate the volume of the prism.
You must show all your working. [4 + 2 OCW]

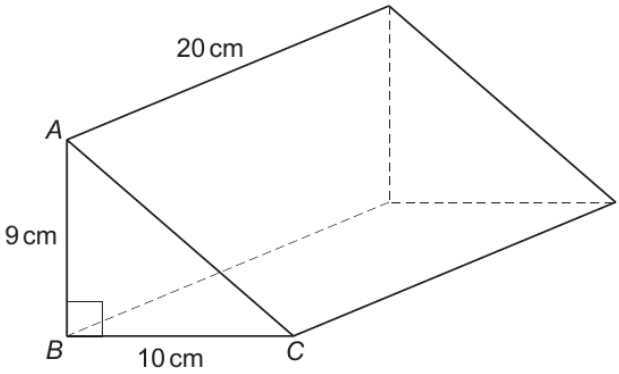


Diagram not drawn to scale

Examiner only

12. Point *P* lies on:

- the bisector of angle *ABC*
- the perpendicular bisector of line *BC*.

Using only a ruler and a pair of compasses, **construct** suitable lines and arcs to show the position of point *P*.

Construction arcs must be clearly shown. [3]

Examiner only

15. In the diagram below, ABC is a right-angled triangle and CDE is an isosceles triangle.

$A\hat{B}C = 90°$, $B\hat{A}C = 64°$ and $CD = CE$.
AD and BE are straight lines intersecting at C.

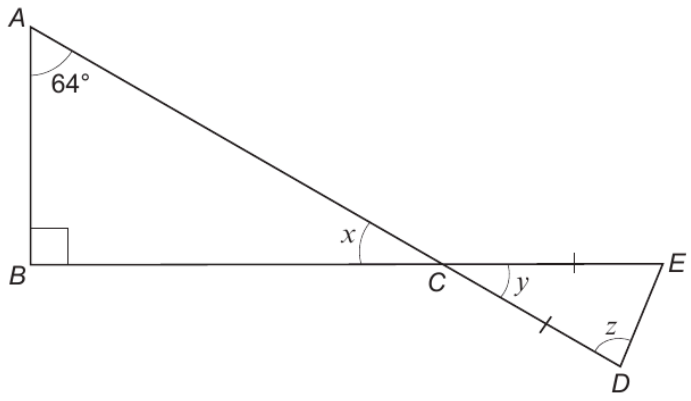


Diagram not drawn to scale

Calculate the size of each of the angles x, y and z. [5]

$x =$ ..... ° $y =$ ..... ° $z =$ ..... °

Examiner only

16. In the diagram below, *ABD* and *BCD* are both right-angled triangles.

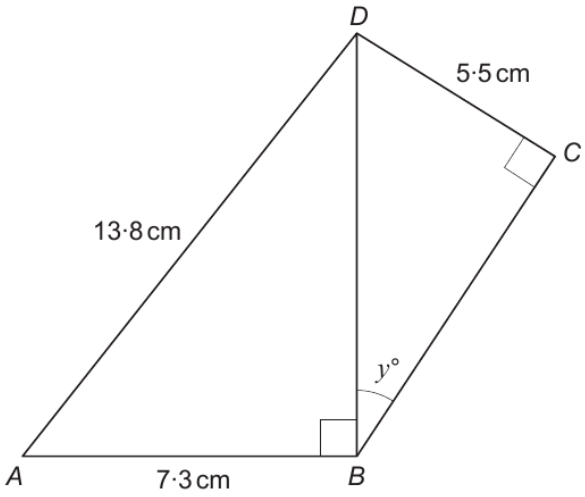


Diagram not drawn to scale

AB = 7·3 cm, *AD* = 13·8 cm and *CD* = 5·5 cm.

Calculate the value of y. [6]

Examiner only

3. (a) Magic Johnson is one of the greatest basketball players of all time.

- He first played for the LA Lakers in 1979.
- His height is 206 cm.
- His salary in 1989 was $3 142 000.

(i) How many years ago did Magic Johnson first play for the LA Lakers? [1]

(ii) What is Magic Johnson's height in metres? [1]

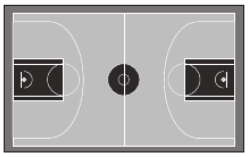
(iii) Write his salary of $3 142 000 in words. [1]

(b) Which of the following is the best description for the shape of a basketball?
Circle your answer. [1]

Sphere Cylinder Cuboid Cone Cube

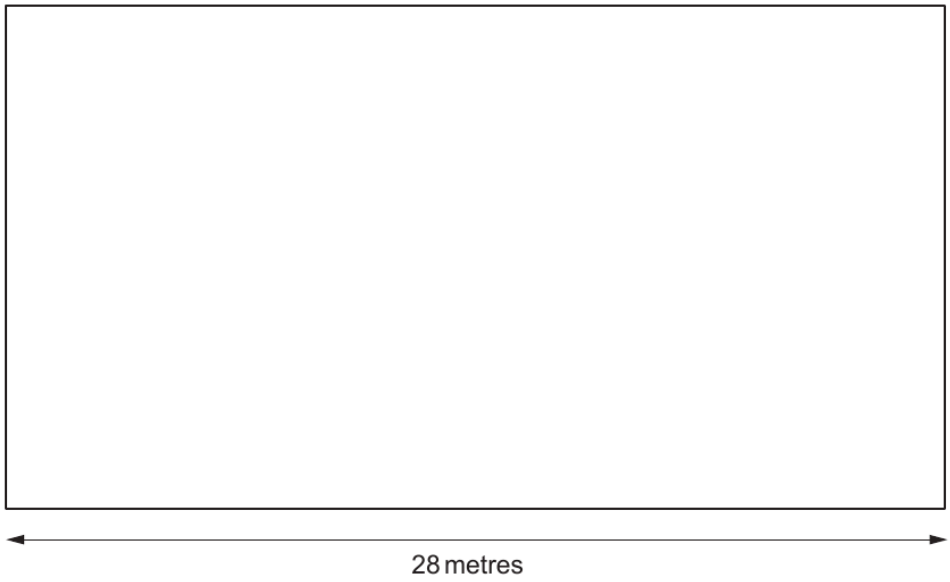
Examiner only

(c) A local basketball club trains on a basketball court each week.



The basketball court is rectangular.

The diagram below is **a scale drawing** of the basketball court.



The **actual length** of the basketball court is 28 metres.
Use the scale drawing to find the **actual width** of the basketball court. [3]

Actual width of the basketball court is ..... metres

Examiner only

(d) The diagram below represents the positions of three players on a basketball court.

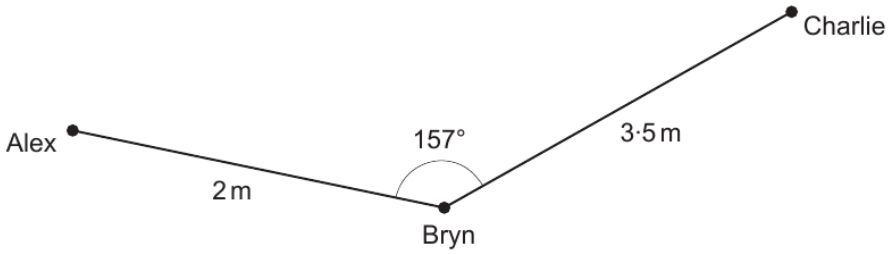


Diagram not drawn to scale

(i) Bryn faces Alex.
Bryn then turns clockwise to face Charlie.

Charlie thinks that Bryn has turned through an acute angle.
Do you agree?
Give a reason for your answer. [1]

Yes ☐ No ☐

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(ii) In the space below, complete an **accurate scale drawing** to show Charlie's position.

The positions of Alex and Bryn are shown.

Use the scale: 1 cm represents 0·5 m. [2]

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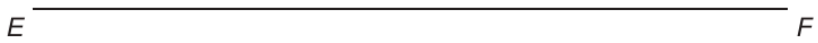
Examiner only

4. (a) Draw $\hat{DEF} = 57°$.
The line EF has been drawn for you. [1]



(b) Dafydd draws an acute angle.
The angle is the same size as half a right angle.
What is the size of the acute angle? [2]

.....

The size of the acute angle is ..... °

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5. (a) Write 25 378 correct to the nearest 100. [1]

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(b) Write down the next number in this sequence. [1]

13, 25, 37, 49, ...

.....

(c) Divide 10 kg by 4.
Give your answer in grams. [2]

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Answer is ..... g

Examiner only

8. Use the formula $T = 4A + 8B$ to find the value of T when A = 45 and B = 19. [2]

9. (a) Tomos wants to find the median of the numbers below.

7 1 20 14 11

He writes the answer 20.

Explain why Tomos's answer is incorrect. [1]

(b) Ted writes down five numbers:

59 89 77 31 83

(i) Calculate the mean of Ted's numbers. [3]

(ii) Every number in Ted's list is decreased by 3.
What is the mean of the numbers in his new list? [1]

Examiner only

11. Steffan uses 654 kWh of electricity in a three-month period.

Electricity costs £0.30 per kWh.
The standing charge for the three-month period is £54.
Steffan has to pay VAT at 5% on the **total** cost.

Calculate Steffan's electricity bill.
You must show all your working. [5]

END OF PAPER

Examiner only

14. (a) Calculate the length of *AC*. [3]

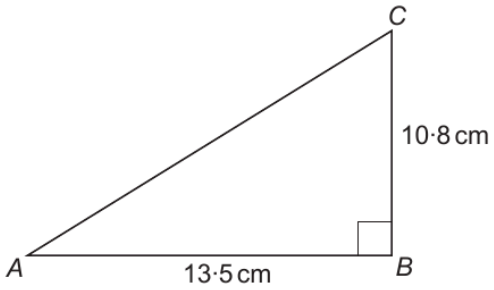

Diagram not drawn to scale

(b) Calculate the value of x. [3]

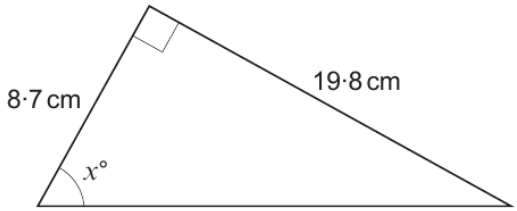

Diagram not drawn to scale

Examiner only

15. Line AB is drawn below.
Point C lies **below** the line AB.
The region in which point C is located is such that:

- $A\hat{B}C \leqslant 30°$
- line $BC \leqslant 5\,\text{cm}$.

Use a ruler and a pair of compasses to **construct** suitable arcs and lines to show this region.
You must show your construction arcs.
Shade the region in which point C is located. [4]

Examiner only

17. Convert $3 \cdot 2 \times 10^4$ metres into **miles**. [3]

$3 \cdot 2 \times 10^4$ metres is ..... miles