Name	Date started	Target end date

REVISE
.wales

F2.05 — Four operations with decimals & negatives

Spec 1.5.1, 1.5.2, 1.5.3, 1.5.4 — Unit 2 (no calculator)

The four operations applied to decimals and negative (directed) numbers without a calculator: column addition and subtraction lining up decimal points, long multiplication and division placing the decimal point at the end, and the sign rules for combining directed numbers. 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: ~5 hours 32 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (221 marks across 104 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).*

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Four operations with decimals & negatives — what the new spec asks

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

Decimal arithmetic 1.1.3

- Add, subtract, multiply and divide decimals without a calculator.
- Line up decimal points when adding or subtracting.
- Place the decimal point correctly in products.

Directed numbers 1.1.5

- Apply the rules of signs for multiplication and division.
- Add and subtract directed numbers using a number line.
- Handle − − = + in algebraic substitution.

Four operations 1.1.9

- Carry out the four operations on integers and decimals.
- Choose an appropriate order of operations (BIDMAS).
- Estimate to check answers are sensible.

Exam strategy 1.1

- Non-calculator — show full column working.
- Estimate first to spot decimal-place errors.
- Check sign of the answer is consistent with the rules.

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Crib sheet »

Four operations with decimals & negatives in one page

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

Adding/subtracting decimals

$$\text{line up the decimal points}$$

Fill gaps with zeros: 3.4 + 2.75 → 3.40 + 2.75 = 6.15.

Multiplying decimals

Ignore the decimal points, multiply as whole numbers, then count the total decimal places in the inputs and place the point.

0.3 × 0.4: 3×4=12, 2 dp total ⇒ 0.12.

Dividing decimals

If dividing by a decimal, multiply both numbers by 10/100… until the divisor is a whole number.

1.2 ÷ 0.4 = 12 ÷ 4 = 3.

Sign rules

$$\text{same signs} \rightarrow +, \text{different signs} \rightarrow -$$

−3 × −4 = +12. −3 × 4 = −12. −12 ÷ −3 = +4.

Subtracting a negative

$$a - (-b) = a + b$$

Two negatives together become a positive.

5 − (−2) = 7.

Common traps

- Misaligning decimal points when stacking.
- Losing the decimal point in multiplication.
- Sign error: − × − is +, not −.

Examiner only

6. *(a)* Write down the first three terms of the sequence whose nth term is given by $2n - 5$. [2]

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The first three terms are ..... , ... and .....

(b) Write down an expression for the nth term of the following sequence. [2]

7, 11, 15, 19, ...

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Examiner only

7. *(a)* Solve these equations.

(i) $7x = 56$ [1]

(ii) $y + 19 = 83$ [1]

(b) Simplify the expression $12k - 15k + 7k$. [1]

8. *(a)* Write down the value of 9^2. [1]

(b) Work out $1{\cdot}2 \times 70$. [1]

Examiner only

7. *ABCD* is a quadrilateral.

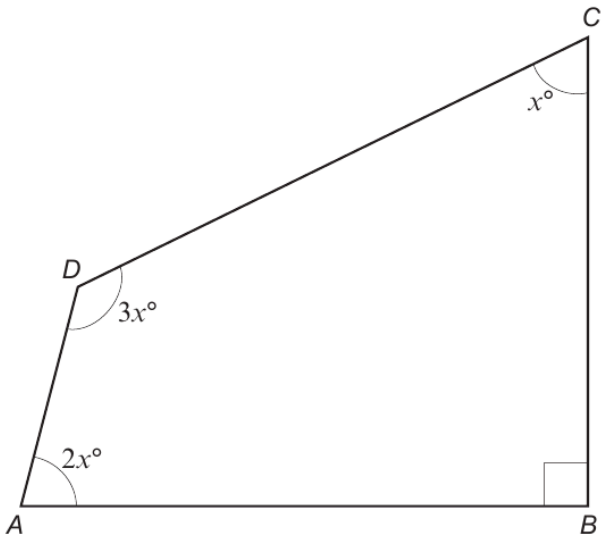

Diagram not drawn to scale

(a) Calculate the value of x. [4]

(b) When *ABCD* is drawn to scale, would the lines *AD* and *BC* be parallel or not? You must justify your answer without using a scale drawing. [2]

Examiner only

11. *(a)* Write down the next two numbers in the following sequence. [2]

35, 25, 16, 8, ... , ...

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(b) Find the value of $2x + 7y$ when $x = -3$ and $y = 10$. [2]

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12. Write down 0·4, 15% and $\frac{7}{20}$ in ascending order.

You must show all your working. [3]

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Smallest value ⟶ Greatest value

Examiner only

17. *ABCD* is a quadrilateral.

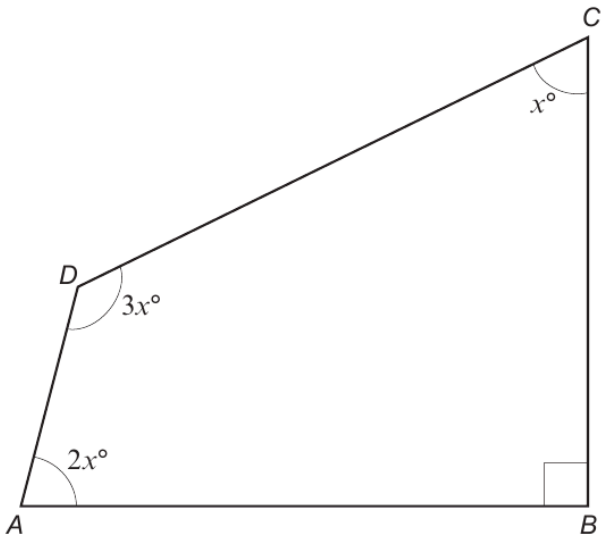

Diagram not drawn to scale

(a) Calculate the value of x. [4]

(b) When *ABCD* is drawn to scale, would the lines *AD* and *BC* be parallel or not? You must justify your answer without using a scale drawing. [2]

Examiner only

18. *(a)* Estimate the value of $\frac{41{\cdot}3 \times 29{\cdot}6}{198{\cdot}7}$.

You must show all your working. [2]

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(b) Given that $54 \times 84{\cdot}2 = 4546{\cdot}8$, write down the exact value of each of the following.

(i) 540×842 = ... [1]

(ii) $\frac{4546{\cdot}8}{5{\cdot}4}$ = ... [1]

(iii) $\frac{454{\cdot}68}{84{\cdot}2}$ = ... [1]

Examiner only

18. Calculate the value of $(5{\cdot}41 \times 10^5) + (2{\cdot}3 \times 10^4)$.
Give your answer in standard form. [2]

19. Rashid owned n sheep.
Eifion had exactly 4 times as many sheep as Rashid.

Rashid buys 17 extra sheep.
Eifion sells 8 of his sheep.

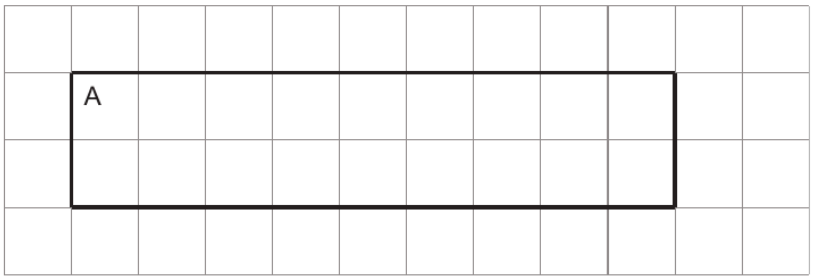
Eifion still has more sheep than Rashid.

Form an inequality, in terms of n.
Solve the inequality to find the **least** value of n.
You must show all your working. [5]

END OF PAPER

Examiner only

4. *(a)* Rectangle A is drawn on the centimetre square grid below.



(i) What is the perimeter of rectangle A? [1]

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Perimeter = ...

(ii) What is the area of rectangle A?
Give the units of your answer. [2]

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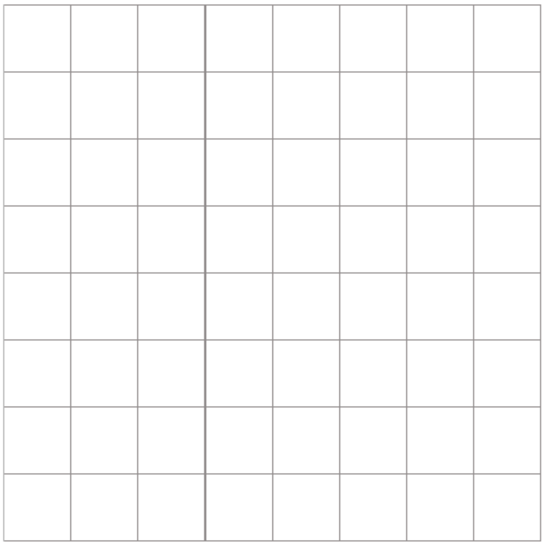
Area = ...

Examiner only

(b) Rectangle B has the same area as rectangle A and fits on the centimetre square grid below.
Rectangle B has a different perimeter from rectangle A.

Draw rectangle B on the grid below. [1]



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Examiner only

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

In the diagram below, *ABCE* is a square whose perimeter is 28 cm.
CDE is a right-angled triangle whose area is 35 cm^2.

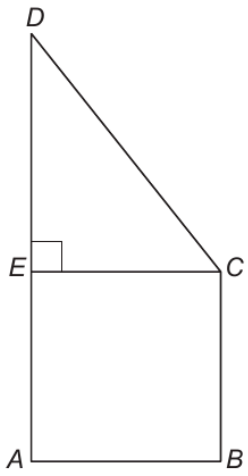

Diagram not drawn to scale

Calculate the length of *DE*.
You must show all your working. [4 + 2 OCW]

Examiner only

9. A number is multiplied by 5.
3 is added to the answer to get 17.
What was the number?
You must show all your working. [2]

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10. Find the value of each of the following.

(a) $\frac{4}{5}$ of 134 [2]

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(b) 30% of 275 [2]

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Examiner only

12. *(a)* Expand and simplify the following expression. [4]

$$x(5x - 2) - 3(x^2 - 2x + 7)$$

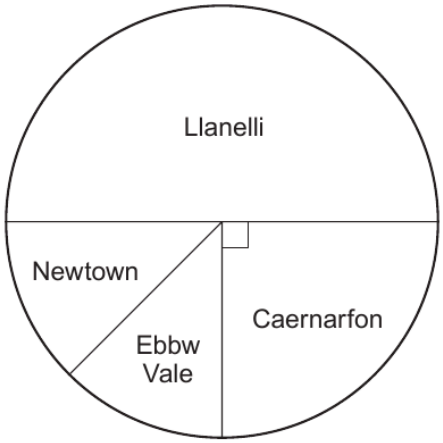
(b) Solve $\frac{22 - f}{3} = 6$. [3]

13. *(a)* A fair, six-sided dice is thrown twice.
What is the probability that a 3 is thrown on both occasions? [2]

Examiner only

(b) A company has offices in Llanelli, Caernarfon, Newtown and Ebbw Vale.
Its national committee is made up of workers from these four offices.

The pie chart below shows what fraction of the committee members come from each office.



There is an equal number of members from Newtown and Ebbw Vale.

A member is chosen at random from this committee to be its chairperson.

(i) The probability that the chosen member works at the Llanelli office is shown in the table below.

Complete the table. [2]

Office	Llanelli	Caernarfon	Newtown	Ebbw Vale
Probability	$\frac{1}{2}$			

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(ii) What is the probability that the member chosen as chairperson works at either the Llanelli or the Ebbw Vale office?
You must show all your working. [2]

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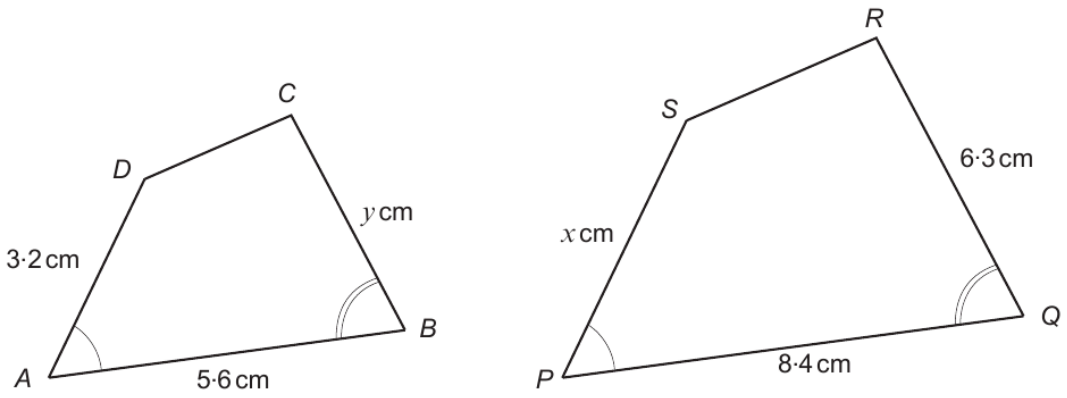
Examiner only

17. The diagrams below show two similar shapes, *ABCD* and *PQRS*.



Diagrams not drawn to scale

(a) Calculate the value of x. [2]

(b) Calculate the value of y. [2]

Examiner only

(c) Explain clearly why the following statement cannot be true. [2]

'The length of CD is 3·9 cm and the length of RS is 6·5 cm'.

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Examiner only

5. *(a)* Estimate the answer to $\frac{59 \times 301}{1997}$.

You must show all your working. [2]

(b) Given that $341 \times 57 = 19\,437$, write down the answer to each of the following.

(i) $3{\cdot}41 \times 5{\cdot}7$ [1]

(ii) $\frac{19\,437}{570}$ [1]

Examiner only

8. *(a)* Mark has some cards. Each card has a number written on it.
These are Mark's cards.
The number on the last card is missing.

3	4	3	5	4	7	3	4	

Write a number on the last card so that the mode of these numbers is an odd number. [1]

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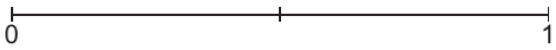
(b) Jane has a different set of cards.
These are Jane's cards.

2	2	4	7	9	15	15	21

Jane chooses a card at random from her set of cards.
On the probability scale below, mark the points A and B where:

(i) A is the probability of Jane choosing a number less than 10, [1]

(ii) B is the probability of Jane choosing the number 15. [1]



Examiner only

8. *(a)* Calculate the approximate difference in length between 1 mile and 1·5 km. Give your answer in metres. [3]

(b) Convert an area of $4\,m^2$ into cm^2. [2]

$4\,m^2 =$ ..... cm^2

Examiner only

15. *(a)* Circle the correct answer for each of the following statements.

(i) $\left(\sqrt{7}\right)^4$ is equal to [1]

$\sqrt{28}$ 28 $\sqrt{14}$ 14 49

(ii) 12^0 is equal to [1]

0 1 1·2 12 120

(iii) $\sqrt{3^2 \times 5^2}$ is equal to [1]

35^2 15^2 15 35 15^4

(iv) 3^{-4} is equal to [1]

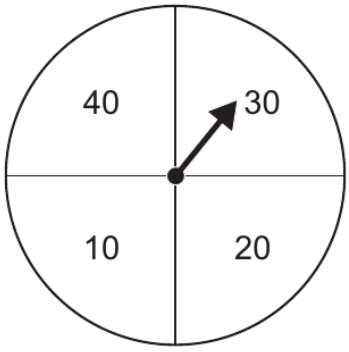
-12 $\frac{1}{81}$ -81 $\frac{1}{12}$ $\frac{3}{4}$

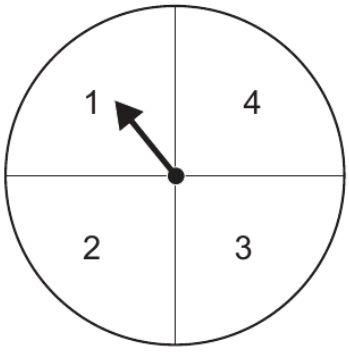
(b) 4×2^{28} can be written as 2^n.
What is the value of n? [2]

$n =$ .....

Examiner only

15. Two fair spinners are divided into quarters as shown below.
One spinner shows the values 10, 20, 30 and 40.
The other spinner shows the values 1, 2, 3 and 4.





The two spinners are spun and the values shown are added together to form a number.
For example, the diagram above would form the number 31.

Consider all the possible numbers that can be formed.
Calculate the probability that the spinners will form a number that is a multiple of 7.
You must show all your working in order to justify your answer. [4]

Examiner only

17. *(a)* Estimate the answer to $\frac{59 \times 301}{1997}$.

You must show all your working. [2]

(b) Given that $341 \times 57 = 19\,437$, write down the answer to each of the following.

(i) $3{\cdot}41 \times 5{\cdot}7$ [1]

(ii) $\frac{19\,437}{570}$ [1]

Examiner only

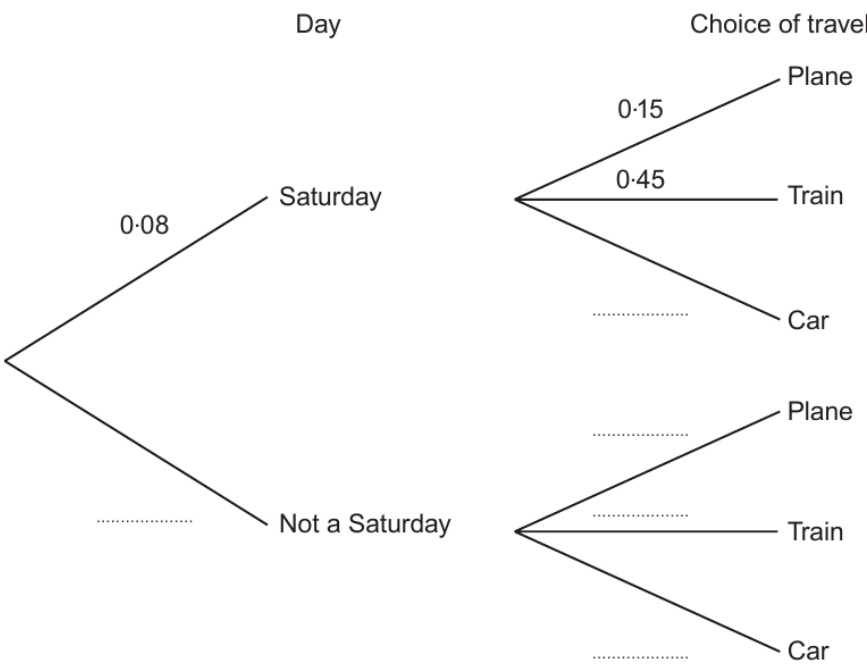
17. Alwena regularly travels from Anglesey to Cardiff to attend meetings.
For each meeting, she chooses one of three ways to travel: by plane, train or car.

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

18. A cuboid has sides x cm, 5 cm and 7 cm.
The total surface area of the cuboid is 142 cm^2.

Form an equation in terms of x.
Solve the equation to find x. [4]

END OF PAPER

Examiner only

5. *(a)* Write 481·627 correct to 2 decimal places. [1]

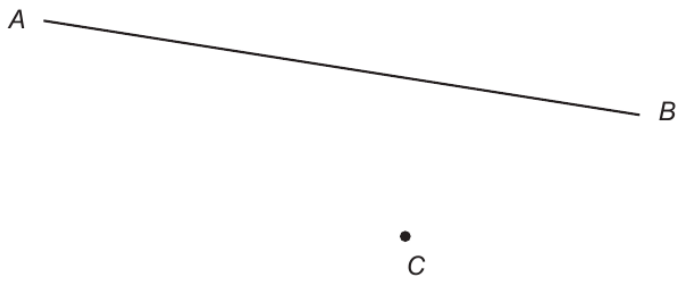
(b) Write down the value of 8^2. [1]

(c) Write down the value of $\sqrt{49}$. [1]

(d) Work out 38·25 ÷ 1000. [1]

Examiner only

4. A line *AB* is shown below.



(a) Mark the midpoint of *AB* with a ×. [1]

(b) Draw a line parallel to *AB* that passes through point *C*. [1]

5. *(a)* Bethan writes down two square numbers.

She adds her two numbers together.
Her answer is a square number less than 30.

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

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Bethan's square numbers are ..... and .....

(b) Harri adds three even numbers together and gets an answer of 23.

Explain how you know that Harri's answer is incorrect. [1]

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Examiner only

9. Circle either TRUE or FALSE for each calculation given below. [3]

CALCULATION		
$23 - (4 + 2) \times 3 = 5$	TRUE	FALSE
$\frac{7}{10} + \frac{2}{5} = \frac{9}{15}$	TRUE	FALSE
$\frac{1}{2}$ of $\frac{1}{8} = \frac{1}{4}$	TRUE	FALSE
25% of 0·4 = 0·1	TRUE	FALSE
$28 - 3 \times 2 + 5 = 55$	TRUE	FALSE

Space for working:

Examiner only

11. Calculate each of the following.

(a) $4{\cdot}8^2 + \sqrt{28{\cdot}09}$ [2]

(b) $\frac{4}{9}$ of 78·3 [1]

Examiner only

16. *ABCD* is a rectangle.
AB is parallel to *EF*.
AC, *CE* and *DG* are straight lines.

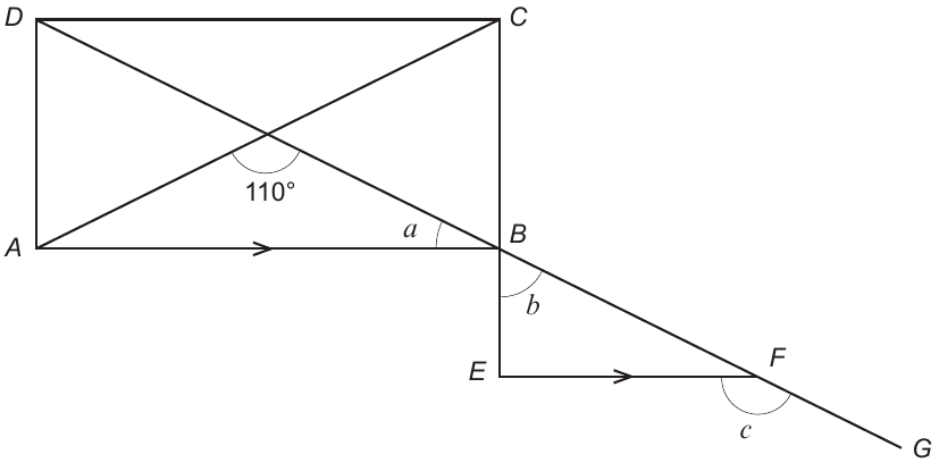


Diagram not drawn to scale

Find the size of each of the angles a, b and c. [4]

a = ... ° b = ... ° c = ... °

Examiner only

17. When a number is reduced by 15%, the answer is 6154.
What is the original number? [3]

18. *ABCD* is a cyclic quadrilateral in a circle with centre *O*.
$\widehat{ABC} = 126°$.

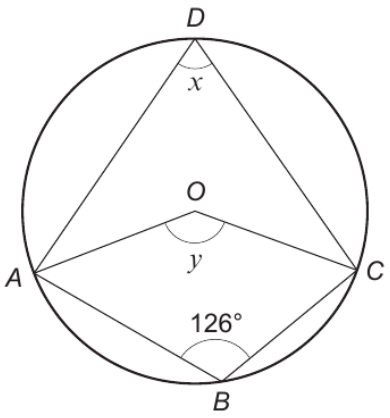


Diagram not drawn to scale

Write down the size of each of the angles x and y.
You must give a reason for each of your answers. [4]

$x =$ ..... °

Reason: .....

.....

$y =$ ..... °

Reason: .....

.....

END OF PAPER

Examiner only

2. *(a)* Write a number in each box so that each calculation is correct.

(i) 397 + 405 = ☐ [1]

(ii) ☐ + 274 = 419 [1]

(iii) 11 × ☐ = 220 [1]

(b) Write these numbers in order of size, beginning with the smallest. [1]

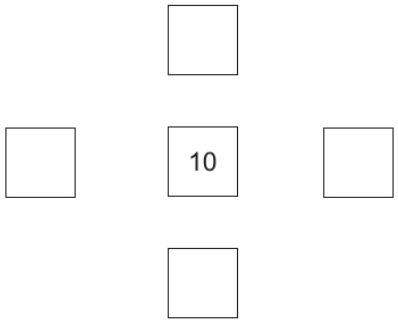
6·49 6·94 6·4 6·9

☐ ☐ ☐ ☐

smallest largest

Examiner only

6. *(a)* Write one of the numbers 3, 5, 7, 9 in each box.
Each number may be used only once.
The sum of the numbers in the column must equal the sum of the numbers in the row.
[1]



Space for working:

(b) Write a **different multiple of 4** in each box to make this sum correct. [2]

Space for working:

Examiner only

5. Complete the table below so that each row will show equivalent fractions, decimals and percentages.
The first row has been completed for you. [4]

Fraction	Decimal	Percentage
$\frac{1}{2}$	0·5	50 %
$\frac{1}{10}$	.....	..... %
$\frac{.....}{25}$	.....	8 %

6. *(a)* Calculate $3 + 5{\cdot}4^2$. [1]

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.....

(b) Calculate $\frac{\sqrt{2{\cdot}56}}{4}$. [1]

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Examiner only

10. *(a)* Fatima writes down three **square** numbers.
The total of the square numbers is 30.

Which square numbers did Fatima write down? [3]

The numbers which Fatima wrote are ..... , ... and .....

(b) Cadfan writes down four **positive odd** numbers.

The mode of his numbers is 7.
The median of his numbers is 6.

Which odd numbers could Cadfan have written down? [3]

The numbers Cadfan could have written are ..... , ... , ... and .....

Examiner only

11. *(a)* Calculate $12\frac{1}{2}\%$ of 1176. [2]

(b) Evaluate $\dfrac{4{\cdot}3 \times 8{\cdot}6}{9{\cdot}3 - 1{\cdot}4}$.

Give your answer correct to 1 decimal place. [2]

Examiner only

20. A cuboid has dimensions of 40 mm, 25 mm and 12 mm.
All of these measurements are correct to the nearest mm.

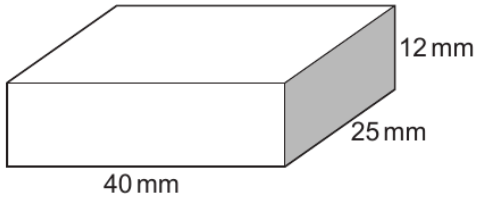

Diagram not drawn to scale

Four of these cuboids are stacked together as shown below.

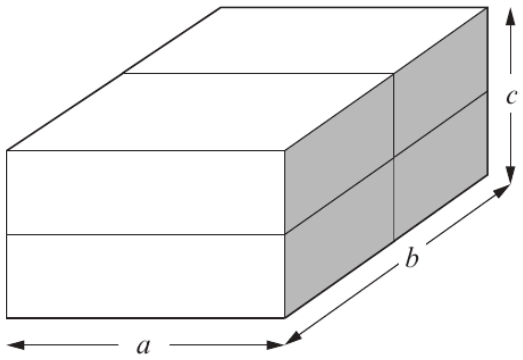

Diagram not drawn to scale

(a) Write down the **greatest** possible value of length a.
Give your answer in mm. [1]

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(b) Calculate the **greatest** possible value of length b.
Give your answer in mm. [1]

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(c) Calculate the **least** possible value of length c.
Give your answer in mm. [1]

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END OF PAPER

Examiner only

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

£1.63	+	35p	=	£ .....
£1.73	+	..... p	=	£2.26
7	×	84p	=	£ .....
17	×	£	=	£6.97

Space for working:

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Examiner only

2. *(a)* Add 4571 and 862. [1]

(b) Subtract 643 from 817. [1]

(c) Calculate one quarter of 300. [1]

(d) Gwilym thinks of a number.
When he divides his number by 7, he gets an answer of 6.

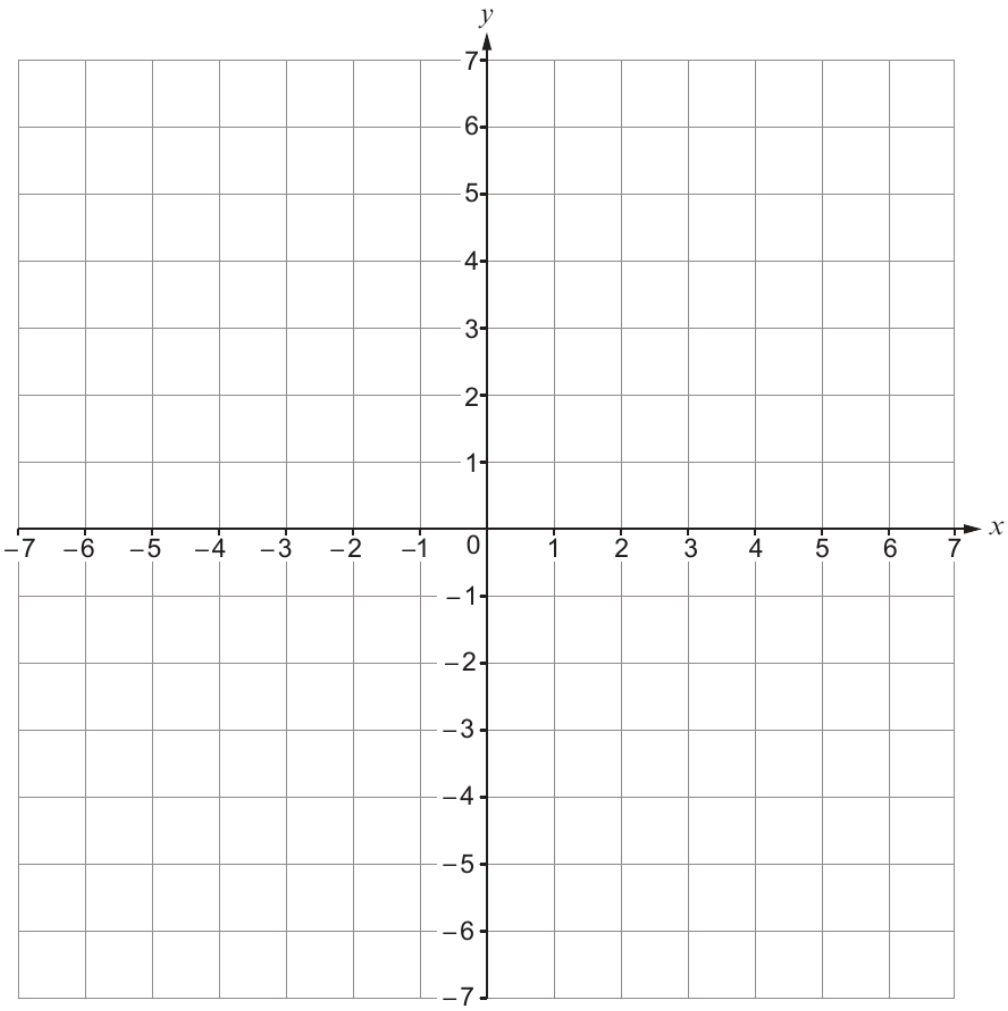
When he divides his number by 2, what should his answer be? [2]

3. *(a)* Write 637 correct to the nearest 100. [1]

(b) Write 3892 correct to the nearest thousand. [1]

Examiner only

2. *(a)* Draw the line $x = -4$ on the grid below. [1]

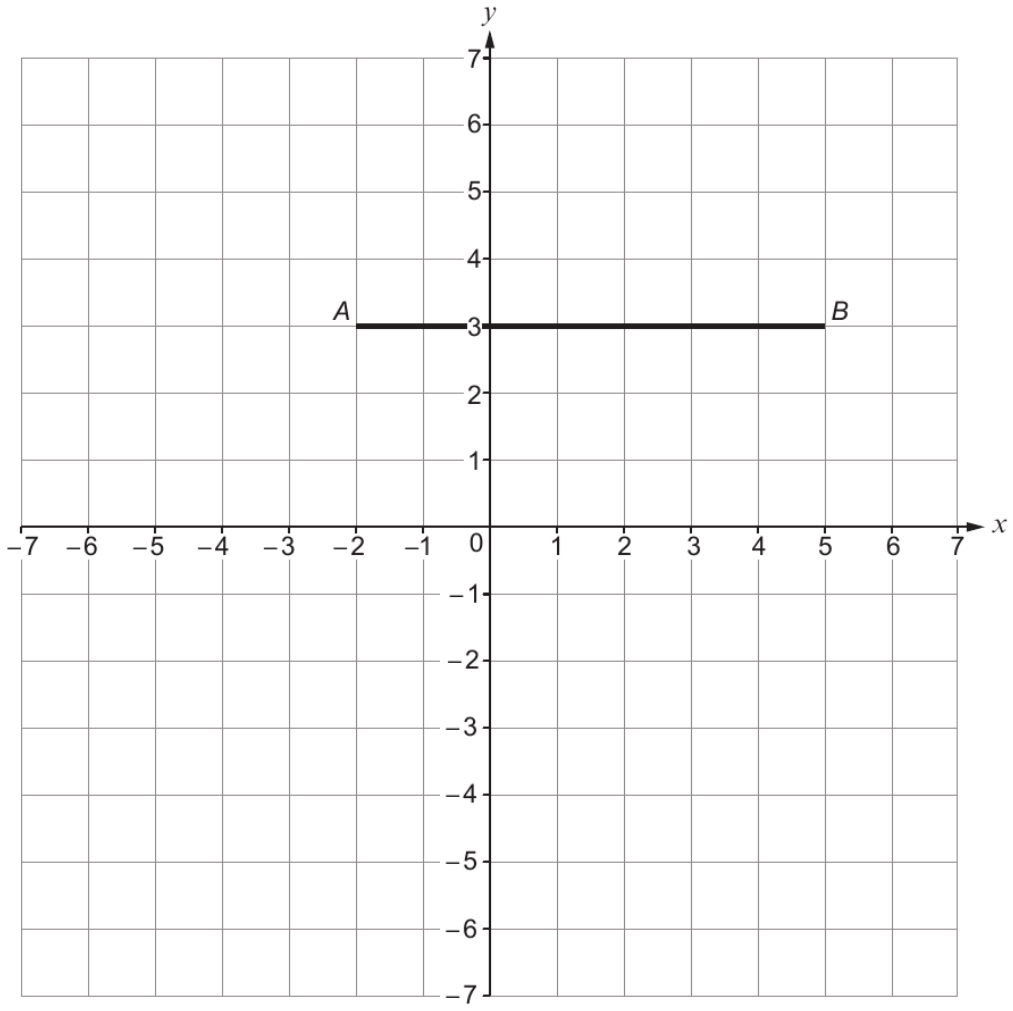


Examiner only

(b) *C* is a point on the grid below so that:

- $\widehat{BAC} = 90°$,
- $AC = AB$.

(i) Show the position of point *C* **on the grid**. [2]



(ii) Write down the coordinates of point *C*. [1]

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Examiner only

7. *(a)* Calculate $\frac{\sqrt{0{\cdot}9216}}{8}$. [1]

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(b) Calculate $\frac{3}{5}$ of 632.

Write your answer as a decimal. [2]

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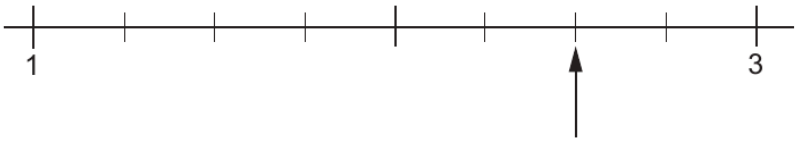
(c) A number line is shown below.
To which number is the arrow pointing? [1]



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8. Complete the table below so that each row will show equivalent fractions, decimals and percentages.
The first row has been completed for you. [4]

Fraction	Decimal	Percentage
$\frac{1}{4}$	0·25	25 %
.....	0·3	..... %
$\frac{.....}{20}$	.....	45 %

Examiner only

10. You are given that $543 \times 17 = 9231$.

(a) What is the value of $5{\cdot}43 \times 1{\cdot}7$?
Circle the correct answer. [1]

0·9231 9·231 92·31 923·1 9231

.....

.....

(b) What is the value of $\frac{9231}{54{\cdot}3}$?

Circle the correct answer. [1]

0·17 1·7 17 170 1700

.....

.....

(c) What is the value of $\frac{9231}{543 \times 1{\cdot}7}$?

Circle the correct answer. [1]

0·1 1 10 100 1000

.....

.....

Examiner only

10. *(a)* (i) Evaluate $\frac{1}{0{\cdot}25^2}$. [1]

(ii) Evaluate $5{\cdot}4^3 \times 3{\cdot}7^2$.
Give your answer correct to the nearest 10. [2]

(b) Find 62% of 7·8. [2]

(c) (i) Which one of the following numbers is a multiple of 19?
Circle your answer. [1]

91 151 199 219 247

(ii) Which one of the following numbers is a cube number?
Circle your answer. [1]

1197 2197 3197 4197 5197

Examiner only

15. Calculate each of the following.

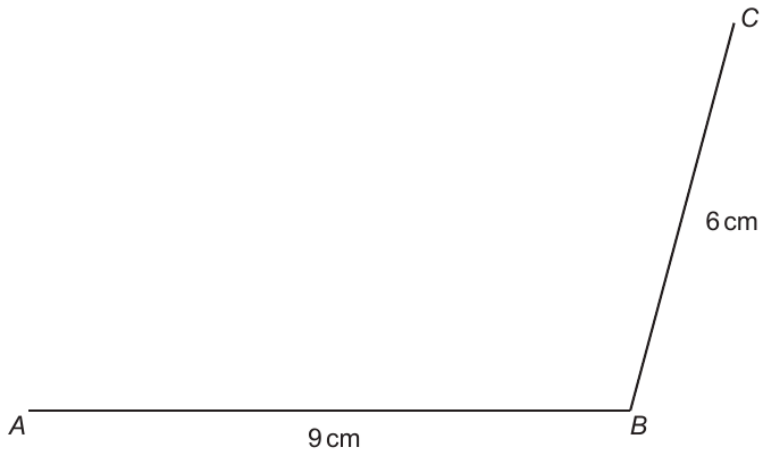
(a) $3^3 \times 10^2$ [2]

(b) $0{\cdot}4 \times 0{\cdot}2$ [1]

(c) $\frac{4}{9} + \frac{5}{18}$ [2]

Examiner only

19. *(a)* Two sides of a parallelogram *ABCD* are drawn accurately below.
Using only a ruler and a pair of compasses, complete an accurate drawing of the parallelogram.
You must show all your construction arcs. [2]



(b) The line *XY* below forms part of a scale drawing of a garden.
The scale drawing has a scale of 1:200.

What is the actual distance between point *X* and point *Y* in the garden?
Give your answer in **metres**. [3]

Actual distance between point *X* and point *Y* = ... metres

Examiner only

19. The diagram below shows a circle with centre at point *O*.
A, *B*, *C* and *D* are all points on the circumference of the circle.

AB = 7·5 cm and *BC* = 4·7 cm.

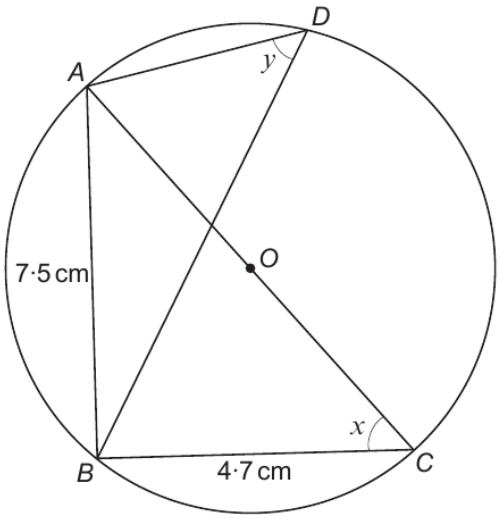


Diagram not drawn to scale

(a) (i) Give the reason why $\hat{ABC}$ is 90°. [1]

.....

.....

(ii) Calculate the size of angle x. [3]

.....

.....

.....

.....

.....

.....

(b) Write down the size of angle y.
State the circle theorem you have used to find your answer. [2]

y = ...

Circle theorem used: .....

.....

END OF PAPER

Examiner only

1. *(a)* Write 95 048 in words. [1]

(b) Find the sum of 872 and 59. [1]

(c) Multiply 250 by 5. [1]

(d) Work out $\frac{1}{3}$ of 624. [1]

(e) Write down all the factors of 18. [2]

The factors of 18 are .....

Examiner only

2. Circle the correct answer to complete each of the following statements.

(a) $\frac{1}{3}$ of $\frac{1}{3}$ is equal to [1]

$\frac{2}{3}$ $\frac{2}{6}$ $\frac{1}{6}$ $\frac{1}{9}$ $\frac{2}{9}$

(b) $0{\cdot}02 \times 0{\cdot}8$ is equal to [1]

0·016 0·16 1·6 0·4 4

(c) 1·5% can be written as [1]

$1{\cdot}5^{100}$ 0·15 0·015 0·105 $1{\cdot}5^{10}$

3. *(a)* Calculate the value of $\frac{2}{5} \times \frac{1}{4}$.

Give your answer in its simplest form. [1]

(b) Calculate the value of $3^3 \div 2^2$.

Give your answer as a decimal. [2]

Examiner only

3. *(a)* Which one of these numbers is both a square number **and** an even number? Circle the correct answer. [1]

2 9 12 16 17

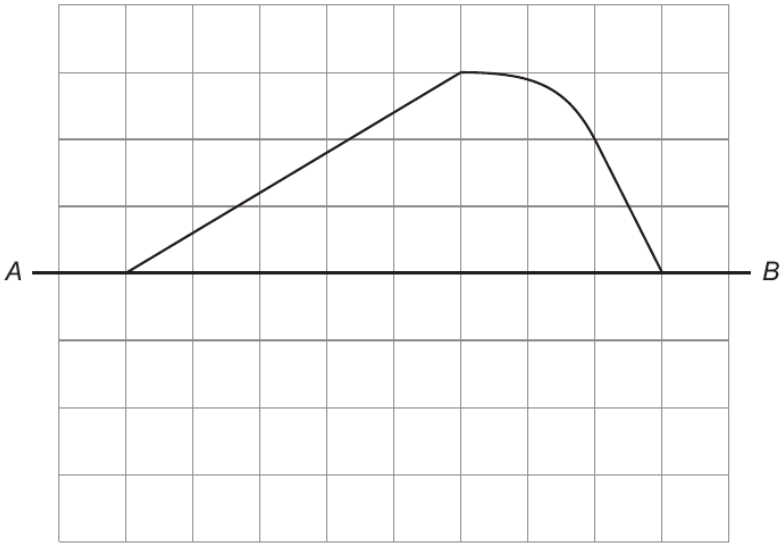
(b) Write 75% as a fraction in its lowest terms. [1]

(c) Write down the mode of these numbers. [1]

28 31 28 29 31 28 34 24 32

Mode is .....

4. Draw a reflection of this shape in the line *AB*. [2]



Examiner only

2. Circle the correct answer to complete each of the following statements.

(a) $\frac{1}{3}$ of $\frac{1}{3}$ is equal to [1]

$\frac{2}{3}$ $\frac{2}{6}$ $\frac{1}{6}$ $\frac{1}{9}$ $\frac{2}{9}$

(b) $0{\cdot}02 \times 0{\cdot}8$ is equal to [1]

0·016 0·16 1·6 0·4 4

(c) 1·5% can be written as [1]

$1{\cdot}5^{100}$ 0·15 0·015 0·105 $1{\cdot}5^{10}$

3. *(a)* Calculate the value of $\frac{2}{5} \times \frac{1}{4}$.

Give your answer in its simplest form. [1]

(b) Calculate the value of $3^3 \div 2^2$.

Give your answer as a decimal. [2]

Examiner only

5. *(a)* A camera was switched on at

21:45 on 20th March, 2021.

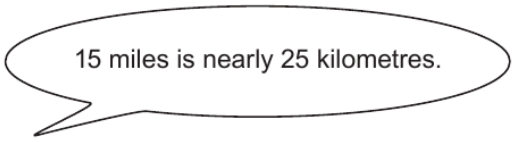
It was left continuously filming until the battery ran out.

The battery lasted for exactly 2 days and 10 hours.

At what time and on which date did the battery run out? [2]

Battery ran out at ..... : ..... on ..... March 2021.

(b) Helen says,



Is she correct?
You must show all your working. [2]

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

11. Circle the correct answer to complete each of the following statements.

(a) $\frac{1}{3}$ of $\frac{1}{3}$ is equal to [1]

$\frac{2}{3}$ $\frac{2}{6}$ $\frac{1}{6}$ $\frac{1}{9}$ $\frac{2}{9}$

(b) $0{\cdot}02 \times 0{\cdot}8$ is equal to [1]

0·016 0·16 1·6 0·4 4

(c) 1·5% can be written as [1]

$1{\cdot}5^{100}$ 0·15 0·015 0·105 $1{\cdot}5^{10}$

12. *(a)* Calculate the value of $\frac{2}{5} \times \frac{1}{4}$.

Give your answer in its simplest form. [1]

(b) Calculate the value of $3^3 \div 2^2$.
Give your answer as a decimal. [2]

Examiner only

13. Thirty numbers are recorded in the grouped frequency table below.

Group	1 to 20	21 to 40	41 to 60	61 to 80	81 to 100
Frequency	3	8	7	6	6

It is decided that the same thirty numbers should be recorded in a table with larger group widths.

This new table is shown below, but only one frequency has been given.

Group	1 to 30	31 to 60	61 to 90
Frequency			12

(a) What is the smallest possible frequency of the 1 to 30 group? [1]

.....

(b) What is the greatest possible frequency of the 31 to 60 group? [1]

.....

Examiner only

3. By first expressing all the amounts below in litres, calculate the mean of the three amounts. [6]

1·25 litres 2·73 pints 1615 ml

1·25 litres	2·73 pints ≈ ..... litres	1615 ml = ... litres

Mean of the three amounts = ... litres

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

7. (a) Describe **in words** the rule for continuing the sequence below. [1]

79, 65, 51, 37, ...

Rule:

.....

.....

(b) Write down the next term in the sequence below. [1]

46, 92, 184, 368, ...

.....

(c) Adrian has n grapes. He eats 4 of them.
Write down, in terms of n, the total number of grapes Adrian now has. [1]

.....

8. Complete the table below so that each row will show equivalent fractions, decimals and percentages.
The first row has been completed for you. [4]

Fraction	Decimal	Percentage
$\frac{1}{4}$	0·25	25%
$\frac{7}{10}$	.....	..... %
$\frac{.....}{20}$	.....	5%

.....

9. Find $\sqrt{11{\cdot}56} + 2{\cdot}5^2$. [1]

.....

.....

Examiner only

12. Calculate each of the following.

(a) $3^2 \times 2^3$ [2]

(b) $-124 \div 4$ [1]

(c) 15% of 280 [1]

13. Write 0·3, $\frac{8}{25}$ and 31% in ascending order.

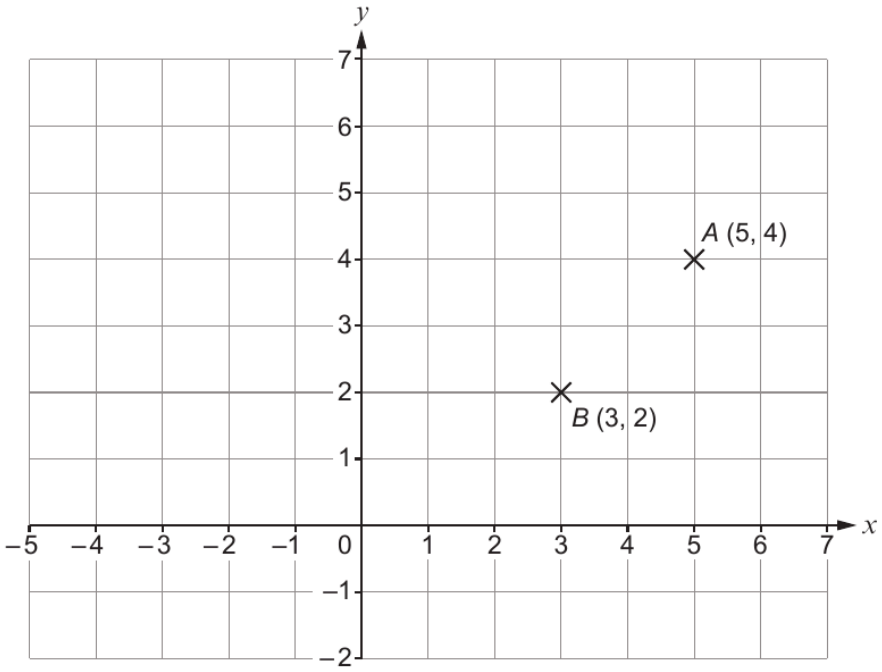
You must show all your working. [3]

....

Smallest value Greatest value

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. Calculate each of the following.

(a) $3^2 \times 2^3$ [2]

(b) $-124 \div 4$ [1]

(c) 15% of 280 [1]

13. Write 0·3, $\frac{8}{25}$ and 31% in ascending order.

You must show all your working. [3]

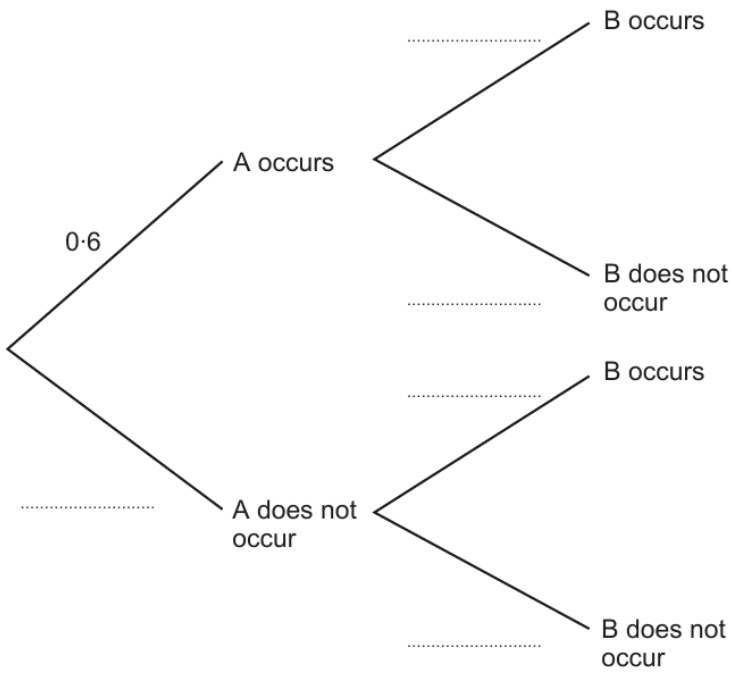
....

Smallest value Greatest value

Examiner only

14. A and B are independent events.
The probability of event A occurring is 0·6.
The probability of event A **and** event B occurring is 0·48.

(a) Complete the tree diagram. [4]



(b) Calculate the probability of neither event A nor event B occurring. [2]

Examiner only

15. (a) Find a whole number value of n, so that $7n-9$ is a multiple of 4.
You must show all your working. [2]

When n = ..., $7n-9$ is a multiple of 4.

(b) Find a whole number value of n, so that $3n-5$ is a prime number.
You must show all your working. [2]

When n = ..., $3n-5$ is a prime number.

Examiner only

16. Solve the following simultaneous equations using an algebraic (not graphical) method. You must show all your working. [4]

$$2x + 3y = 29$$
$$5x - 4y = -8$$

Examiner only

17. Circle the correct answer for each of the following statements.

(a) $7{\cdot}2\,m^3$ is equal to [1]

$720\,cm^3$ $72\,000\,cm^3$ $7{\cdot}2 \times 10^5\,cm^3$ $7{\cdot}2 \times 10^3\,cm^3$ $7{\cdot}2 \times 10^6\,cm^3$

.....

(b) $36^{\frac{1}{2}}$ is equal to [1]

18 6 $\frac{1}{18}$ $\frac{1}{6}$ $\frac{1}{36}$

.....

18. Find the value of $\frac{30\,000}{1{\cdot}5 \times 10^5}$.

Write your answer as a decimal. [2]

.....

.....

.....

.....

.....

.....

.....

END OF PAPER

Examiner only

1. (a) One of the calculations below is incorrect.
Circle the incorrect calculation. [1]

$78 + 9952 = 10030$ $875 \div 35 = 25$ $3685 - 2852 = 833$

$452 \times 63 = 28466$ $89775 \div 45 = 1995$

(b) One of the numbers below is a multiple of 38.
Circle the multiple of 38. [1]

2 19 338 388 3838

(c) Computers cost £432 each.
How many can be bought with £9876? [1]

Examiner only

2. Calculate the value of $7p + 6q$ when $p = -9{\cdot}2$ and $q = 4{\cdot}7$. [2]

Examiner only

2.

The table below shows the number of visitors to some of the top attractions in Wales in 2017 and 2018.
The table also shows the percentage change in the number of visitors from 2017 to 2018.

Attraction	Number of visitors 2017	Number of visitors 2018	Percentage change
Folly Farm	480 000	455 428	–5·1%
Cardiff Castle	319 131	452 007	+41·6%
Bodnant Garden	255 949	260 153	+1·6%
Caernarfon Castle	204 675	205 009	+0·2%
Conwy Castle	221 652	201 961	–8·9%
Zip World Slate Caverns	190 000	195 000	+2·6%

Use the information in the table above to answer the following questions.

(a) Zip World Slate Caverns had 195 000 visitors in 2018.
Write this number in words. [1]

.....

.....

(b) Which attraction had the smallest percentage change from 2017 to 2018? [1]

.....

.....

(c) Calculate the total number of visitors to Bodnant Garden in 2017 and 2018. [2]

.....

.....

.....

Examiner only

(d) Calculate the difference between the number of visitors to Cardiff Castle in 2017 and the number of visitors to Cardiff Castle in 2018. [2]

(e) Ian looks at the data and says,

"In 2018, Folly Farm had about half a million visitors."

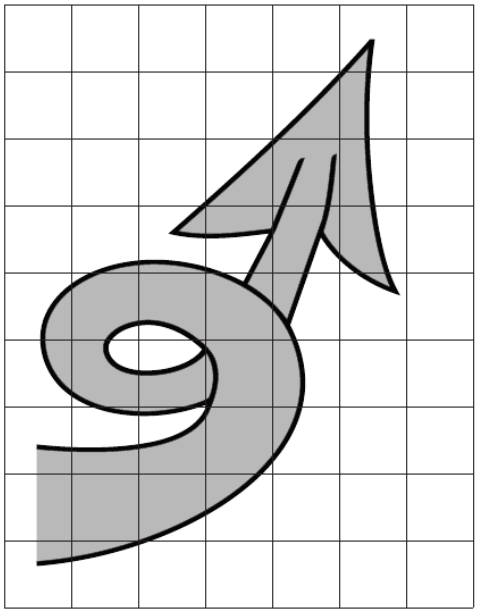
Is Ian correct?
Give a reason for your answer. [1]

Yes ☐ No ☐

Examiner only

(f) A new visitor attraction, Tailspin, wants to use the tail of the dragon from the Welsh flag as its logo.

The tail is drawn on the centimetre square grid below.
Each square on the grid represents an area of 4 cm^2.



Tailspin is planning to make flyers to advertise the attraction.
To print the flyers, the area of the tail must be less than 48 cm^2.

The manager of Tailspin thinks that the area of the tail is greater than 48 cm^2.

Decide whether or not the manager is correct.
You must show all your working. [3]

The manager is:

Correct ☐ Not correct ☐

.....

.....

.....

.....

.....

Examiner only

3. (a) Martina is going to buy some milk to make pancakes.

Small
500 ml for 40p

Medium
1200 ml for £1.20

Large
2000 ml for £2.50

Which size carton of milk offers the best value for money?
You must show all your working. [3]

(b) Martina's pancake recipe is as follows.

Pancake recipe – Makes 12 pancakes
100 g flour
2 eggs
300 ml milk

Calculate the quantity of milk needed to make 30 pancakes. [2]

Milk: ..... ml

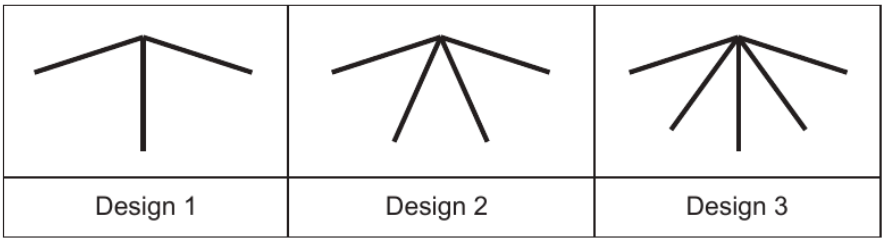
3310U301
07

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

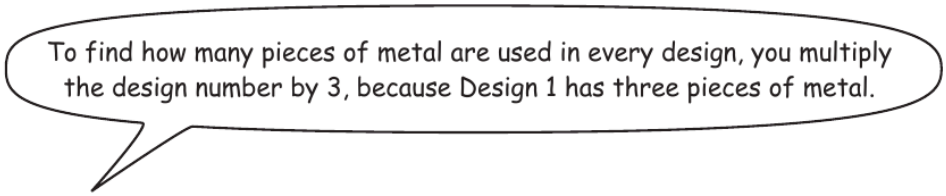
(a) How many pieces of metal will be used to make the brooch in Design 5? [1]

.....

(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.

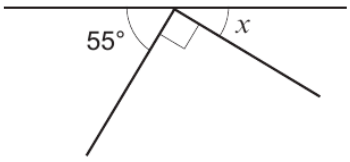


Diagram not drawn to scale

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]

.....

.....

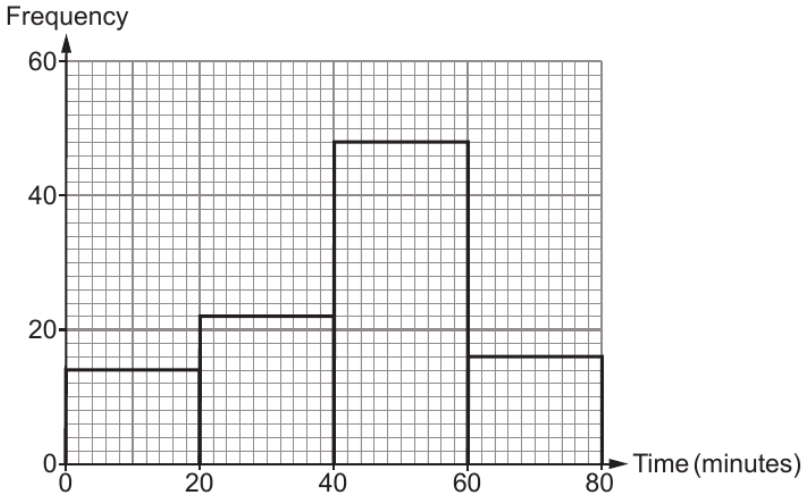
.....

.....

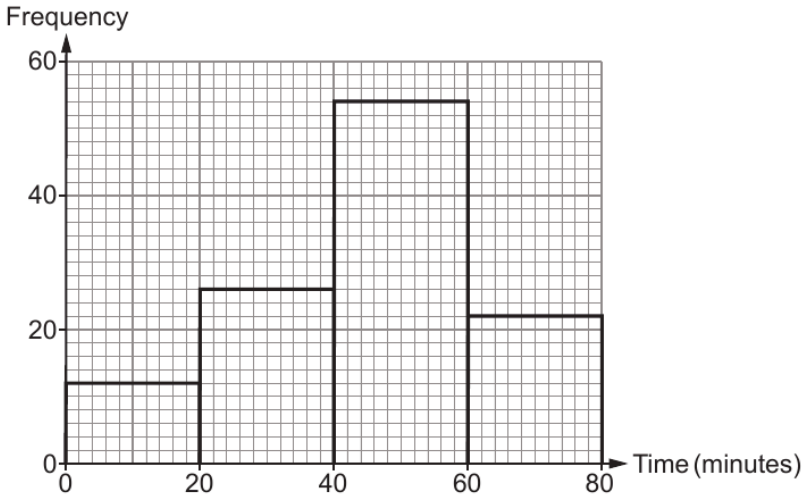
Cost of materials is £ .....

6. The frequency diagrams below show the lengths of time that men and women spent training in the gym on Friday.

Time spent training – Men



Time spent training – Women



Examiner only

(a) Freddie says he spent exactly 1 hour 25 minutes training in the gym on Friday.
Explain how you know that Freddie is not telling the truth. [1]

(b) How many men spent less than 20 minutes training in the gym on Friday?
Circle your answer. [1]

12 14 54 6 20

(c) How many women spent less than 40 minutes training in the gym on Friday?
Circle your answer. [1]

14 26 34 38 76

(d) Gwen says,

"A greater **proportion** of women than men spent between 40 and 60 minutes training in the gym on Friday."

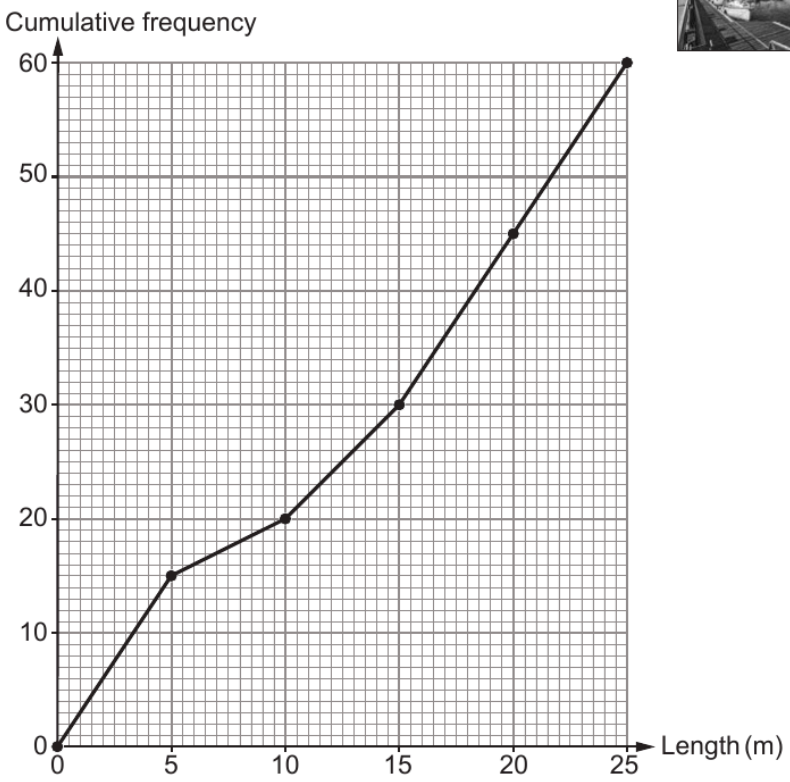
Is Gwen's statement true or false?

True ☐ False ☐

You must show all your working to support your answer. [5]

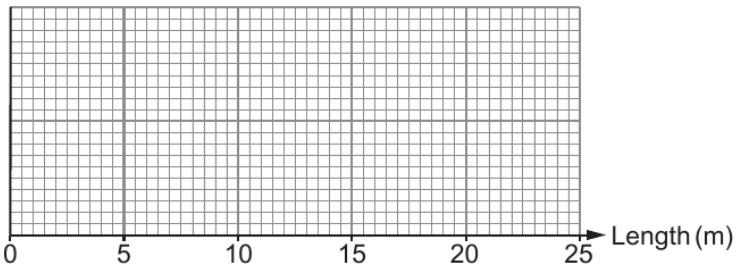
Examiner only

7. (a) The lengths of the 60 yachts in Eog Marina were measured.
The results are shown in the cumulative frequency diagram below.



The shortest yacht has a length of 3 m.
The longest yacht has a length of 22 m.

Use the information above to complete a box-and-whisker diagram on the graph paper below. [3]



.....

.....

Examiner only

(b) The lengths of the 68 yachts in Clwyd Marina were measured.

For these yachts:
- the lower quartile of their lengths is 10 m
- 25% have lengths greater than 18 m
- the median length is 11·6 m.

(i) Calculate how many of the yachts in Clwyd Marina have lengths greater than 10 m. [2]

..... yachts

(ii) In which marina, Eog or Clwyd, is the interquartile range of the lengths of the yachts greater?

Eog Marina ☐ Clwyd Marina ☐

You must show all your working. [2]

(iii) In which marina is the longest yacht?

Eog Marina ☐ Clwyd Marina ☐ Can't tell ☐

You must give a reason for your answer. [1]

Examiner only

7. (a) 10 years ago, Matteo bought a car for £4500.
His car depreciated in value by 20% in the **first** year.
In each of the following years, his car depreciated by 14% of its previous year's value.

Show that the value of Matteo's car is now less than £950.

You must show all your working. [3]

(b) Matteo's car insurance has increased by 25% from the amount he paid last year.
His car insurance is £750 this year.

Calculate the amount Matteo paid for his car insurance last year. [2]

Matteo paid £ ..... for his car insurance last year.

Examiner only

(c) The diagram below shows the front of Matteo's garage.

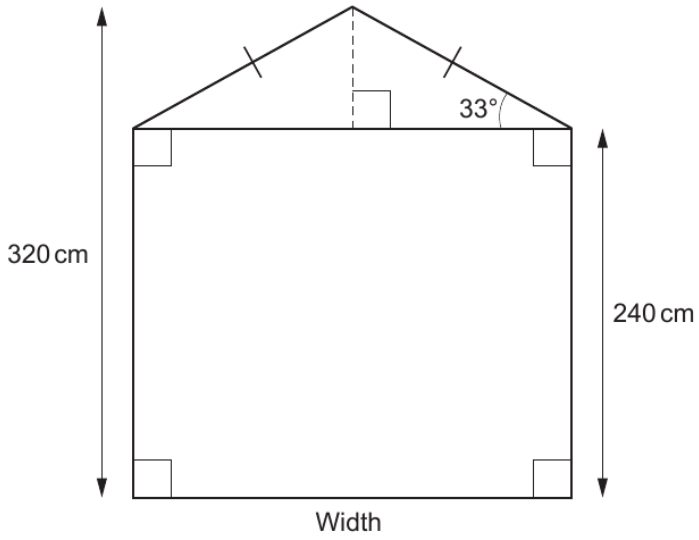


Diagram not drawn to scale

Calculate the width of Matteo's garage. [5]

Examiner only

(d) The length of Matteo's car is 400 cm, correct to the **nearest 10 cm**.
The length of his garage is 550 cm, correct to the **nearest 10 cm**.

When Matteo parks his car, he leaves exactly 70 cm between the car and the back wall of the garage.

Calculate the maximum length of the space between Matteo's car and the garage door.
[3]

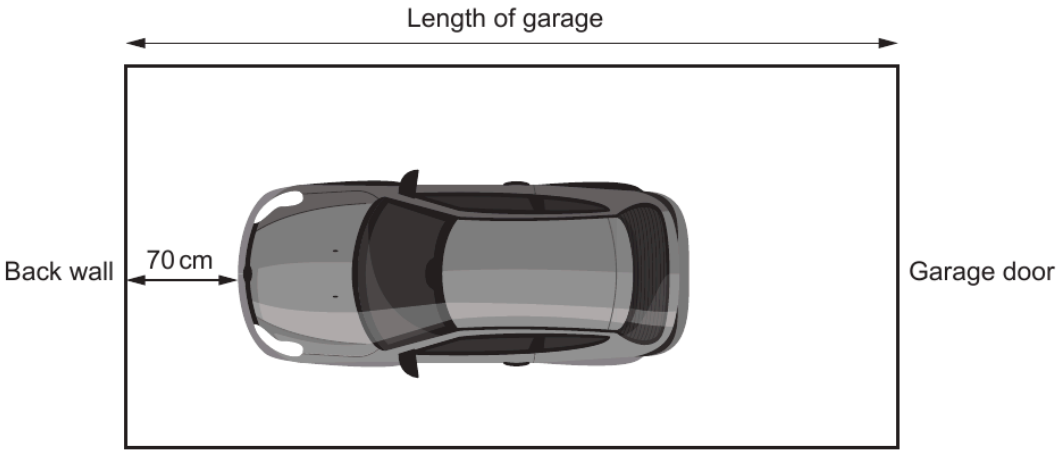


Diagram not drawn to scale

Examiner only

7. Mary has 6 oranges and 11 apples in a bag.
She chooses one piece of fruit from the bag at random.

What is the probability that Mary chooses an apple? [2]

.....

.....

8.

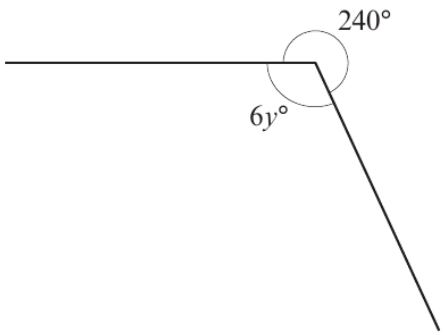


Diagram not drawn to scale

Calculate the value of y. [3]

.....

.....

.....

.....

.....

.....

y = ...

Examiner only

13. Laura puts 90 counters in a bag.
Each counter is red or blue or yellow.

Laura wants to draw a pie chart to show the number of counters of each colour.
The table below shows some of the information that she needs.

	Number of counters	Pie chart angle
Red	25	.....
Blue	.....	180°
Yellow	.....	.....
	Total = 90	

(a) Complete the table.
You must show all your working. [5]

.....

.....

.....

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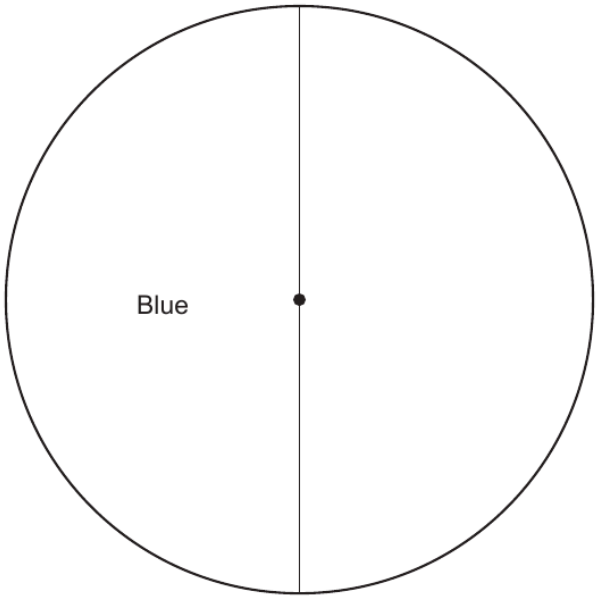
.....

Examiner only

(b) Complete the pie chart to show the results. [2]



(c) Laura chooses a counter at random from the bag.
Calculate the probability that this counter is either red or blue. [2]

.....

.....

.....

.....

Examiner only

14. Two friends, Geraint and Dyfrig, are having a discussion.

(a) Geraint says,

"All prime numbers are odd numbers."

Explain why Geraint is incorrect. [1]

(b) Dyfrig says,

"All cube numbers are odd numbers."

Explain why Dyfrig is incorrect. [1]

Examiner only

15. Calculate the length of the side YZ in the triangle XYZ shown below. [3]

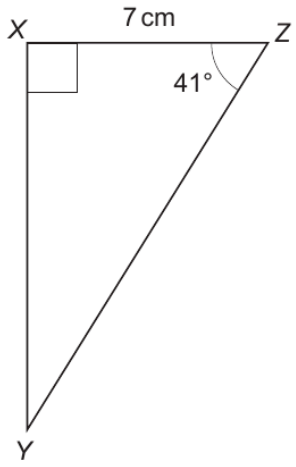


Diagram not drawn to scale

Examiner only

16. Two times are recorded correct to the **nearest 0·1 second**.

12·4 seconds
25·5 seconds

Calculate the greatest possible difference between these times. [3]

17. A number has been increased by 60% to give an answer of 64.
What was the original number? [2]

Examiner only

4. (a) Which of the following is nearest in mass to 5 kg?
Circle the correct answer. [1]

7 lb 11 lb 15 lb 19 lb 23 lb

.....

.....

(b) Which of the following is nearest in volume to 100 litres?
Circle the correct answer. [1]

100 pints 125 pints 150 pints 175 pints 200 pints

.....

.....

5. Rhian is n years old.
Samir is 7 years younger than Rhian.
Nigel is twice as old as Samir.

Write down an expression, in terms of n, for Nigel's age. [3]

.....

.....

.....

Nigel's age .....

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

15. In the diagram below, AD is a straight line.

$B\hat{A}C = 90°$, $B\hat{D}E = 90°$ and $C\hat{B}E = 90°$.

$AC = 7{\cdot}7$ cm, $BC = 11{\cdot}3$ cm and $BD = 13{\cdot}1$ cm.

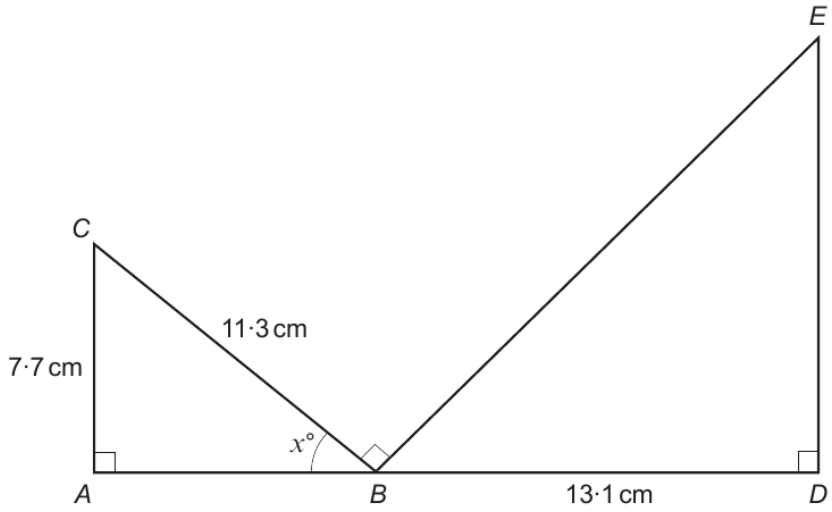


Diagram not drawn to scale

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

Examiner only

15. Rhian is n years old.
Samir is 7 years younger than Rhian.
Nigel is twice as old as Samir.

Write down an expression, in terms of n, for Nigel's age. [3]

.....

.....

.....

Nigel's age .....

16. 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.

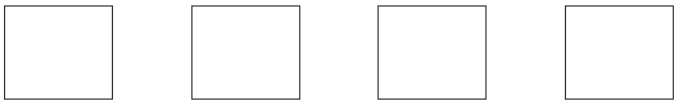
Write your four numbers in the boxes below. [2]

.....

.....

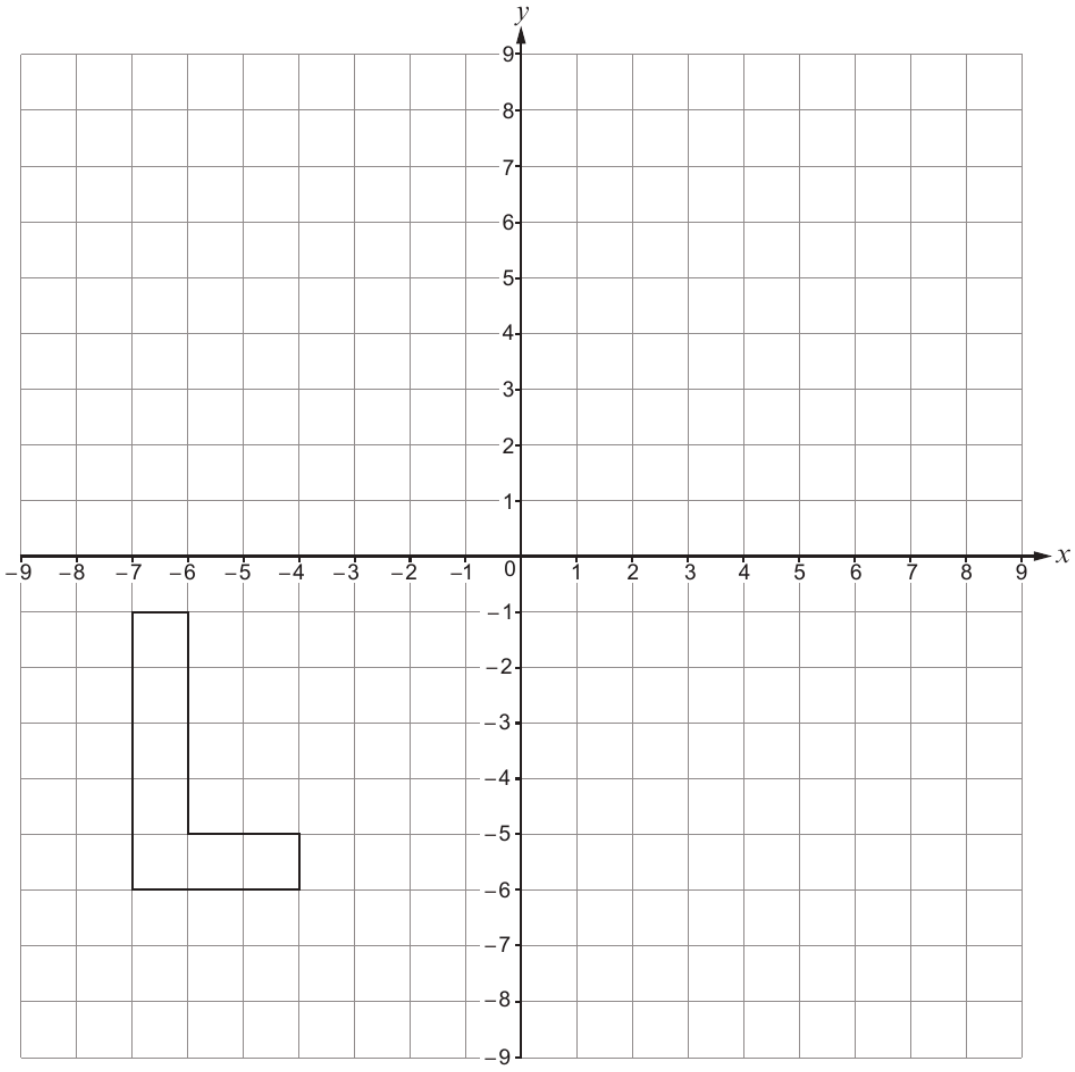
.....

.....



Examiner only

20. Rotate the shape shown below by 90° anticlockwise about the origin. [2]



END OF PAPER

Examiner only

2. (a) Arwyn doubles the number fifty-three thousand.
Write Arwyn's answer in figures. [2]

(b) Write 3572 correct to the nearest 100. [1]

(c) Calculate $6+4\times9$. [1]

(d) Estimate $103\times9\cdot8$. [2]

(e) Can 626 be divided exactly by 3?
You must show working to support your answer. [1]

Yes ☐ No ☐

Examiner only

5. The map below shows part of South West Wales.

(a) Find the bearing of St Brides from Fishguard. [1]

..... °

(b) The distance by road from Haverfordwest to Milford Haven is 12 km.

(i) Estimate the distance by road from Haverfordwest to Fishguard. [1]

..... km

Examiner only

(ii) Owain has a **different** map that has a scale of 1 : 25000.

Owain measures the distance by road from Haverfordwest to Milford Haven on his map.
Complete Owain's statement below.

"On my map, the distance by road from Haverfordwest to Milford Haven is

represented by a length of ..... cm." [3]

.....

.....

.....

.....

.....

.....

Examiner only

7. A report from a Saturday newspaper is shown below.

> **Mean rainfall for the last 5 days is 42 mm**
>
> Mid Wales had significant rainfall over the last 5 days.
> 40 mm of rain fell on Monday, 37 mm on Tuesday and 39 mm on Wednesday.
> Thursday was the wettest day, when 48 mm of rain fell.
> Rain fell again on Friday.
> The mean rainfall per day for these 5 days was 42 mm.

(a) Calculate the rainfall for Friday.
You must show all your working. [3]

Rainfall on Friday was ..... mm

(b) It did not rain on Saturday or Sunday in this week.
Calculate the mean rainfall per day for the week. [2]

Mean rainfall per day for the week is ..... mm

Examiner only

9. A car was bought in 1973 for £2500.

In the first year, this car depreciated by 23% of its value.
In each of the following 39 years, it depreciated by 4% of its value the previous year.

The car then started to increase in value.
In each of the next 10 years, it increased by 14% of its value the previous year.

Calculate the value of the car after these 50 years.
You must show all your working. [4]

The value of the car after 50 years is £ .....

END OF PAPER

Examiner only

19.

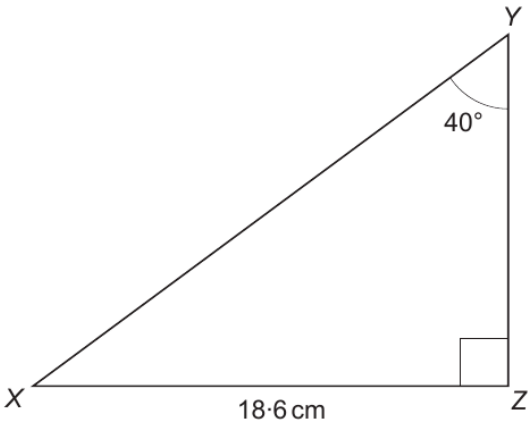


Diagram not drawn to scale

Calculate the length of the side *YZ*. [3]

20. 7 cubes are stacked on top of each other.
Each of these cubes has edges of length 60 mm, measured correct to the nearest millimetre.

Calculate the greatest possible height of this stack of 7 cubes. [2]

Examiner only

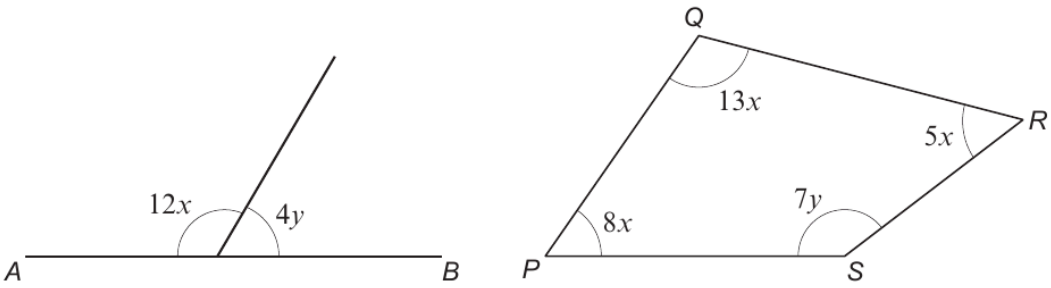
21. The grouped frequency table below shows data for 32 values of t.
One of the frequencies in the table is represented by a.

t	Frequency
$20 \leqslant t < 30$	2
$30 \leqslant t < 40$	8
$40 \leqslant t < 50$	4
$50 \leqslant t < 60$	a
$60 \leqslant t < 70$	3
$70 \leqslant t < 80$	5

Find the estimated mean value of t for the 32 values. [5]

Examiner only

22. *AB* is a straight line.
PQRS is a quadrilateral.
Each angle is given in terms of x or y.



Diagrams not drawn to scale

Use an algebraic method to find the value of x and the value of y. [6]

x = ... and y = ...

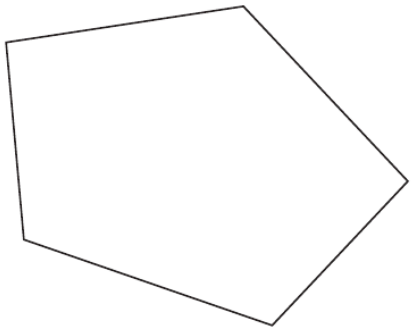
END OF PAPER

Examiner only

1. (a) Calculate 5620 × 100. [1]

(b) Write 42 861 correct to the nearest hundred. [1]

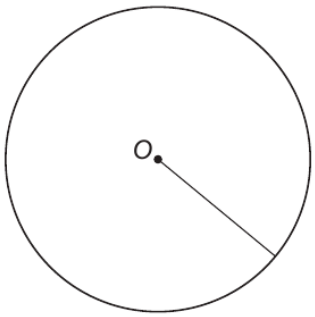
2. (a)



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

pentagon hexagon kite parallelogram rhombus

(b)



O is the centre of the circle shown above.

What is the special name of the straight line shown in the diagram?
Circle your answer. [1]

circumference tangent diameter radius chord

Examiner only

4. (a) Circle **all** the fractions that are equal to $\frac{5}{6}$. [2]

$\frac{45}{56}$ $\frac{55}{66}$ $\frac{45}{46}$ $\frac{35}{42}$ $\frac{51}{61}$

(b) Calculate $\frac{\sqrt{0 \cdot 64}}{4^2}$. [1]

.....

.....

(c) Here are four digits.

7 3 6 5

Write the four digits in the following boxes to form two 2-digit numbers.
You need to arrange the four digits so that the **product** is as **small** as possible.

You can use each digit only once. [2]

.....	.....	×	.....	.....

Space for working:

.....

.....

.....

Examiner only

4. During the 30 days in the month of September, Andras used 138 m^3 of gas.
The cost of this gas was 12p per kWh.

> The formula used to calculate the number of kWh for the gas used is as follows:
>
> Number of kWh = number of m^3 of gas × 39·5 × 1·02264 ÷ 3·6

The standing charge was 32p per day.
VAT at 5% was payable on the sum of the cost of the gas used and the standing charge.

Calculate Andras's gas bill for September.
You must show all your working. [7]

Examiner only

7. (a) Jemma is asked to work out the following calculation.

$$10 + 4 \times 9$$

Jemma's method is

14 × 9 = 126

Explain why Jemma's method is wrong. [1]

(b) Sion is asked to answer the following question.

How many halves are there in 20?

Sion's method is

20 ÷ 2 = 10

Explain why Sion's method is wrong. [1]

(c) Rebecca is asked to find the range of the numbers below.

7 1 20 14 11

Rebecca's method is

11 − 7 = 4

Explain why Rebecca's method is wrong. [1]

Examiner only

(d) Stef knows what $\frac{1}{5}$ of Paulo's number is.

Using this information, **explain** how Stef can work out $\frac{1}{10}$ of Paulo's number. [1]

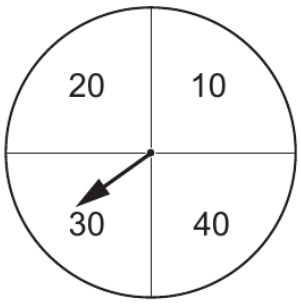
.....

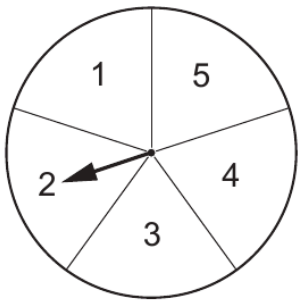
.....

.....

Examiner only

8. Ahmed organises a game using two fair spinners, as shown below.
The first spinner shows the values 10, 20, 30 and 40.
The second spinner shows the values 1, 2, 3, 4 and 5.





In the game, the two spinners are spun and the values shown are added to give a score.
For example, the spinners above score 32.

Ahmed charges £1 for each attempt at the game.
Any player who scores **43 or more** wins £5.

Calculate Ahmed's expected profit when this game is played 100 times. [7]

3300U301
09

Examiner only

9. (a) The area of Wales is 20 735 km^2.

The table below gives the population of Wales in 1977, 1998 and 2015.

Year	1977	1998	2015
Population	2·8 million	2·9 million	3·1 million

(i) What was the increase in the population of Wales between 1977 and 1998? Circle your answer. [1]

1×10^3 1×10^4 1×10^5 1×10^6 1×10^7

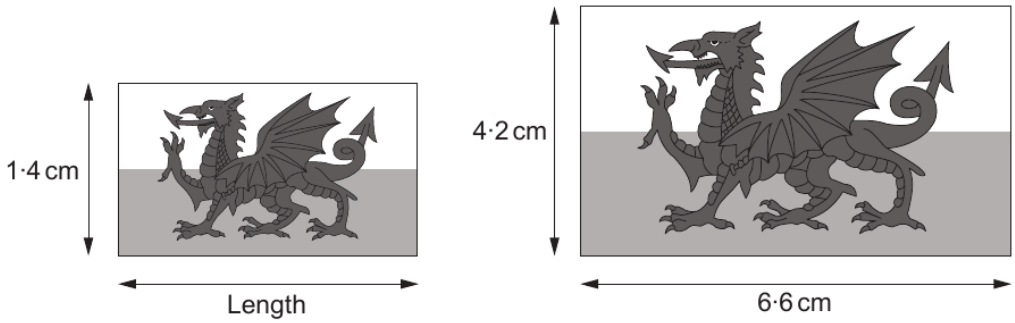
(ii) Estimate the population density of Wales in 2015. [3]

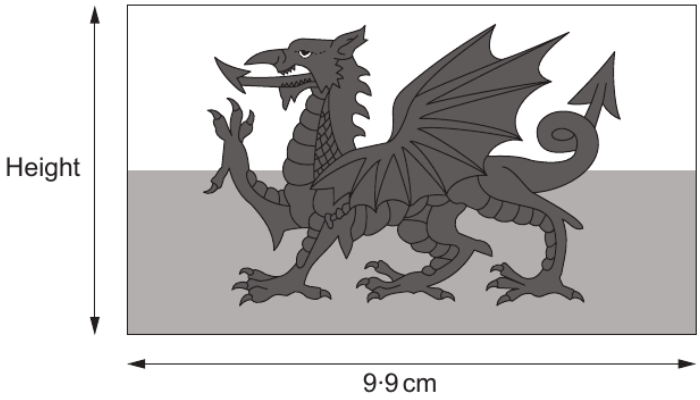
Population density of Wales in 2015 was ..... people / km^2

(b) Cardiff is the largest city in Wales.
In 2018, the population of Cardiff was approximately 360 000.
The population of Cardiff increased by 20% from 1991 to 2018.
Calculate the population of Cardiff in 1991. [3]

Examiner only

(c) DraigYma prints Welsh flags onto stickers.
Three of their mathematically similar Welsh flag stickers are shown below.





Diagrams not drawn to scale

Calculate the missing length and height in the diagrams. [4]

Length is ..... cm Height is ..... cm

END OF PAPER

Examiner only

9. During the 30 days in the month of September, Andras used 138 m^3 of gas.
The cost of this gas was 12p per kWh.

> The formula used to calculate the number of kWh for the gas used is as follows:
>
> Number of kWh = number of m^3 of gas × 39·5 × 1·02264 ÷ 3·6

The standing charge was 32p per day.
VAT at 5% was payable on the sum of the cost of the gas used and the standing charge.

Calculate Andras's gas bill for September.
You must show all your working. [7]

Examiner only

9. (a) A volcano is an opening in the Earth's crust, through which molten lava, hot ash and gases escape into the air.

(i) An estimated 500 000 000 people live near active volcanoes.
What is 500 000 000 written in standard form? [1]

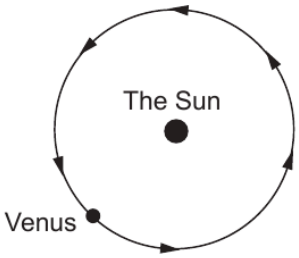
(ii) The teragram is a unit of mass.
1 teragram = 10^9 kg

Last year, a volcano released a total of 140 teragrams of carbon dioxide in 300 days.

Calculate the average number of kilograms of carbon dioxide that were released by this volcano **per hour**.
Give your answer correct to 3 significant figures.
You must show all your working. [5]

Examiner only

(b) (i) The planet Venus orbits the Sun.
Its orbit can be considered to be circular.



The distance between Venus and the Sun is $1{\cdot}08 \times 10^8$ km.

Venus orbits the Sun once every 224·7 days.

Calculate the distance Venus travels in 1 day.
Give your answer in standard form. [4]

(ii) The surface area of Venus is 460 234 320 km^2.
The surface of Venus is wrinkled-volcanic, smooth-volcanic or **non**-volcanic.
The areas of these three different types of surface are in the ratio 7 : 1 : 2.

Wrinkled-volcanic : Smooth-volcanic : Non-volcanic = 7 : 1 : 2

Calculate the total surface area of Venus that **is** volcanic.
You must show all your working. [3]

END OF PAPER

Examiner only

11. Ifan has chosen four odd numbers.
Some of the numbers are the same and some of them are different.
Ifan's numbers are all less than 10.

Both the mode and the mean of Ifan's numbers are 7.

What numbers has Ifan chosen? [3]

Ifan's numbers are ☐ ☐ ☐ ☐

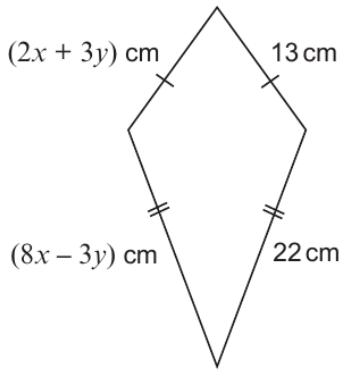
12. Evaluate each of the following.

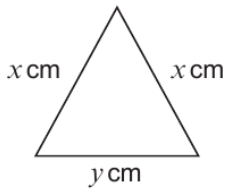
(a) $0{\cdot}8 \times 0{\cdot}25$ [1]

(b) $13{\cdot}4 - 2{\cdot}96$ [1]

Examiner only

18. A kite and an isosceles triangle are shown below.
They are not drawn to the same scale.





Diagrams not drawn to scale

Using the information shown on the kite, calculate the perimeter of the isosceles triangle.
Do not use a trial and improvement method.
You must show all your working. [5]

Perimeter of the isosceles triangle = ... cm

END OF PAPER

Examiner only

2. (a) Write down the value of the 3 in the number 532 719. [1]

(b) Add the numbers 865 and 92 and 407. [1]

(c) Subtract 647 from 1029. [1]

3. (a) Which is the best metric unit for measuring the mass of a pencil?
Circle the correct answer. [1]

kilograms grams tonnes centimetres milligrams

(b) Which is the best metric unit for measuring the distance from Swansea to Wrexham?
Circle the correct answer. [1]

millimetres metres kilometres litres kilograms

Examiner only

4. Bethan has two brothers, Andrew and Richard.

Andrew is 7 years older than Bethan.
Richard is 3 years older than Andrew.

(a) Today, the sum of all their ages is 59 years.
How old are Bethan, Andrew and Richard today? [2]

Bethan = ... years old

Andrew = ... years old

Richard = ... years old

(b) (i) Write down the ratio of Andrew's age to Richard's age when Andrew is 27.
Write the ratio in its simplest form. [2]

Ratio of Andrew's age to Richard's age = ... : .....

(ii) Explain why the ratio of Andrew's age to Richard's age can never be 1 : 1. [1]

Examiner only

4. In the grid below:

- each column must add to 150
- each row must add to 150.

Complete the grid. [3]

83	.....	.....
45	.....	88
.....	93	.....

.....

.....

.....

.....

.....

.....

5. Sophie says,

"5 minutes 8 seconds is double 2 minutes 54 seconds."

Is Sophie correct?

YES ☐ NO ☐

You must show working to support your answer. [2]

.....

.....

.....

.....

.....

Examiner only

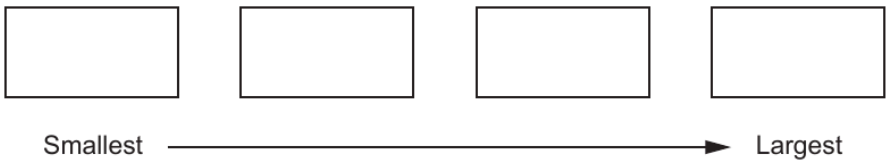
8. (a) Solve $7x = 63$. [1]

(b) Solve $27 - x = 19$. [1]

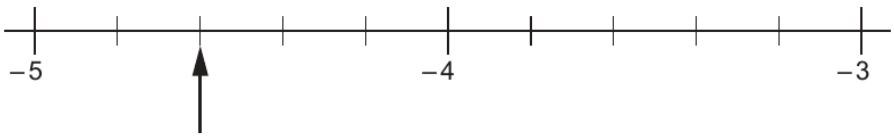
(c) Simplify $17k - 8k + 5k$. [1]

9. (a) Write these numbers in order in the boxes below.
Start with the smallest number. [1]

3 −17 12 −6



(b) A number line is shown below.
Which number is the arrow pointing to? [1]



The number is .....

Examiner only

9. (a) The base of a flagpole is fixed to horizontal ground.
It is held vertically by a straight rod of length 3·8 m.
The rod is fixed to the ground and to a point 1·5 m from the top of the flagpole.
The flagpole and the rod are shown in the diagram below.

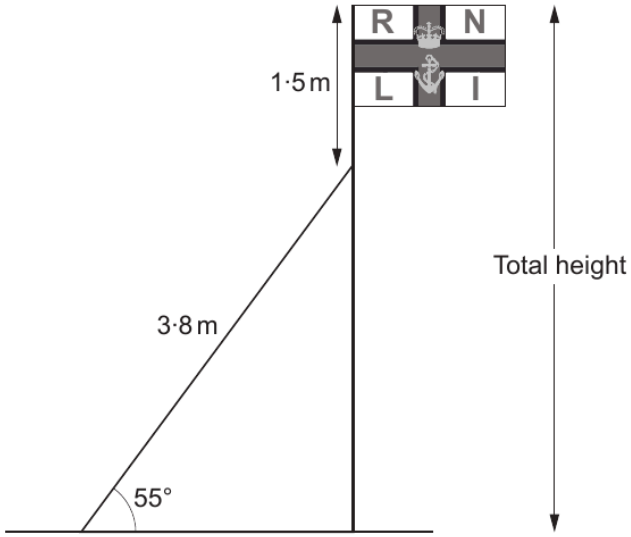


Diagram not drawn to scale

Calculate the **total** height of the flagpole.
Give your answer correct to the nearest centimetre. [4]

Examiner only

(b) Mathematically similar large, medium and small flags are made.

Diagrams not drawn to scale

(i) Calculate the length of the medium flag. [2]

.....

.....

.....

.....

Length of the medium flag is ..... cm

(ii) Calculate the height of the small flag. [2]

.....

.....

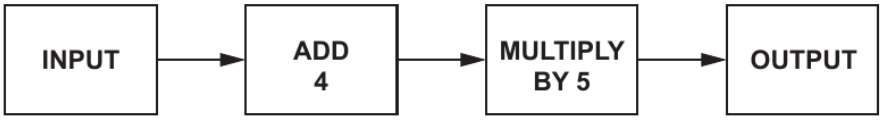
.....

.....

Height of the small flag is ..... cm

Examiner only

11. A number machine is shown below.



Complete the table below. [5]

INPUT	OUTPUT
–7	
	–100
2·5	
n	

Space for working:

12. **Estimate** the value of 33 × 7940.
You must show your approximations in your working. [2]

Examiner only

12. Shipping containers are used to transport goods around the world.
The dimensions of a shipping container are as follows:

- The height is 2·59 m, correct to the nearest centimetre.
- The width is 2·43 m, correct to the nearest centimetre.
- The length is approximately double the width.

(a) What is the least possible **width** of this shipping container?
Circle your answer. [1]

2·425 m 2·42 m 2·435 m 2·426 m 2·424 m

(b) An end view of a stack of these shipping containers is shown below.

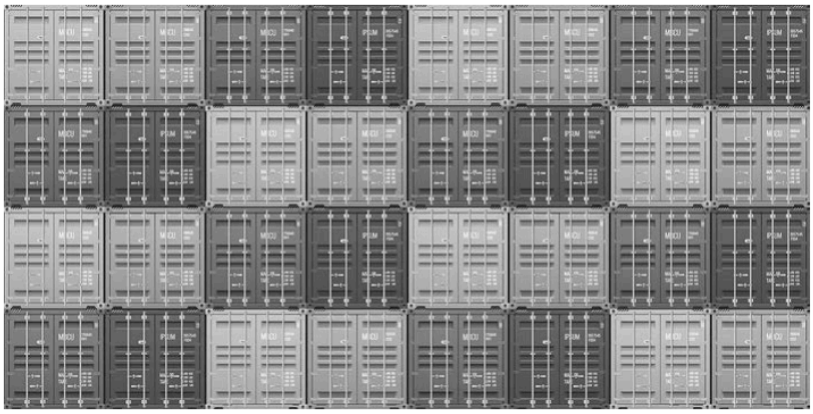


Diagram not drawn to scale

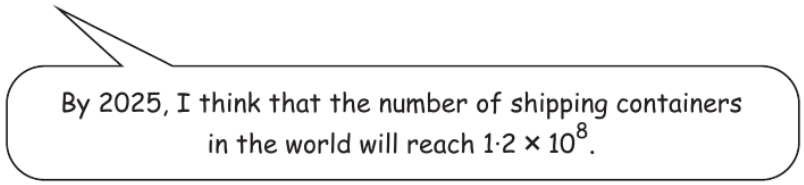
(i) Calculate the greatest possible **height** of the stack of shipping containers.
Give your answer in metres. [3]

Examiner only

(ii) There are 32 shipping containers in this stack.
Sketch the plan view of this stack of shipping containers in the space below. [1]

(c) In 2012, there were 2×10^7 shipping containers in the world.

Joshua says,



Assuming Joshua is correct, complete the statement below.

"By 2025, the percentage increase in the number of shipping containers in the world since 2012 will be ..... %."

You must show all your working. [3]

END OF PAPER

Examiner only

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

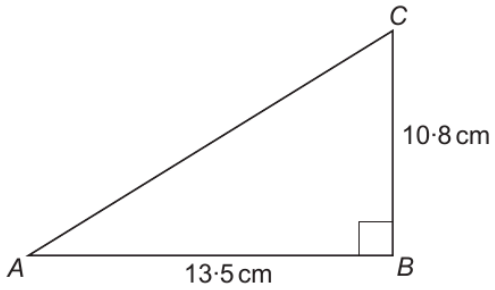


Diagram not drawn to scale

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

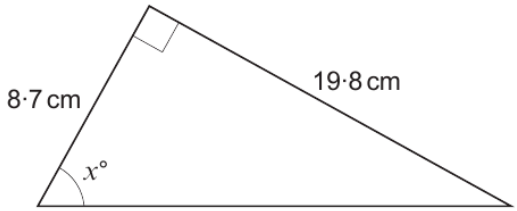


Diagram not drawn to scale

Examiner only

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

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