Candidate Name	Centre Number	Candidate Number
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WJEC CBAC

GCSE

185/08

SOLUTIONS

MATHEMATICS
FOUNDATION TIER
PAPER 2

A.M. TUESDAY, 10 November 2009

2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	6	
2	5	
3	3	
4	7	
5	4	
6	2	
7	4	
8	4	
9	4	
10	4	
11	4	
12	6	
13	4	
14	4	
15	7	
16	5	
17	4	
18	4	
19	8	
20	5	
21	3	
22	3	
TOTAL MARK		

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution especially when a calculator is used.

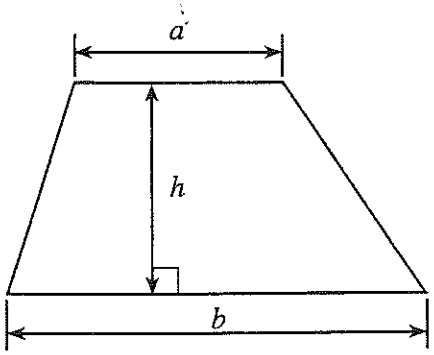
Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

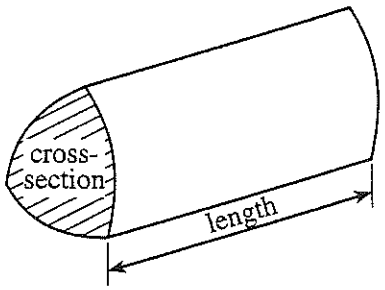
The number of marks is given in brackets at the end of each question or part-question.

Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



Examiner only

1. *(a)* Alice buys 3 packets of biscuits at £1.35 each and 2 bars of muesli at 56p each.
How much is this altogether?

$3 \times 1{\cdot}35 = 4{\cdot}05$

$2 \times 56 = +1{\cdot}12$

£5·17

[3]

(b) John and his two brothers go to town on the bus.
John pays for the 3 tickets with a £5 note.
Each ticket costs 93p.
How much change should he receive?

$3 \times 93 =$ £2·79

∴ £2·21 change.

[3]

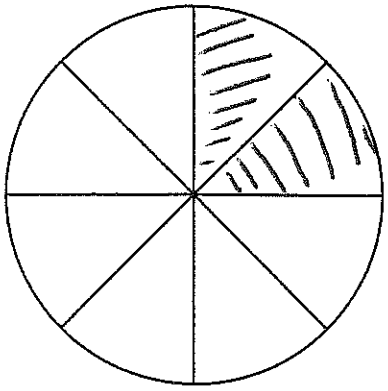
Examiner only

2. *(a)* Draw a circle around each of the following fractions which is **NOT** equal to $\frac{1}{3}$.

$\frac{5}{15}$ $\frac{3}{30}$ $\frac{4}{12}$ $\frac{2}{6}$ $\frac{3}{6}$

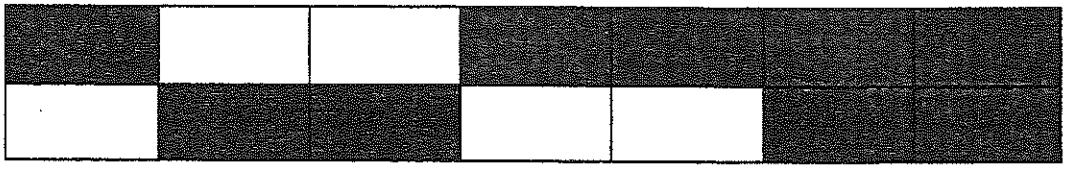
[2]

(b) Shade 25% of the following figure.



[1]

(c) (i) What fraction of the following shape is shaded?



$\frac{9}{14}$

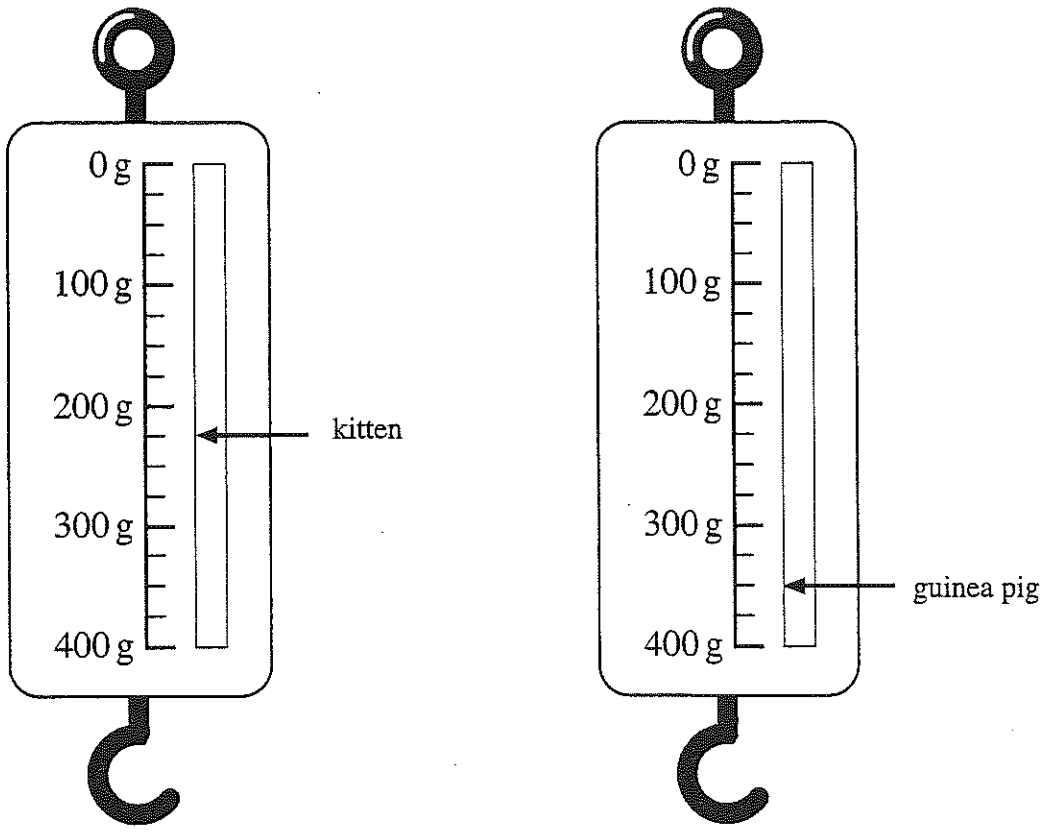
(ii) What fraction of the shape is **NOT** shaded?

$\frac{5}{14}$

[2]

Examiner only

3. Megan weighs her guinea pig and her kitten using a spring balance.



(i) Write down the weight of her kitten.

225 g

(ii) How much heavier is the guinea pig than the kitten?

350 - 225

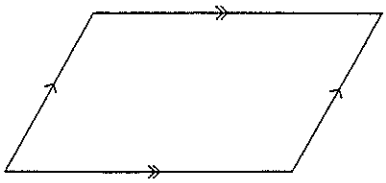
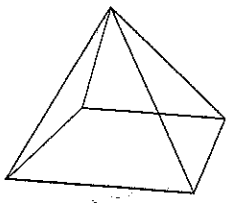
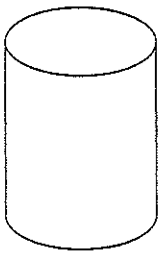
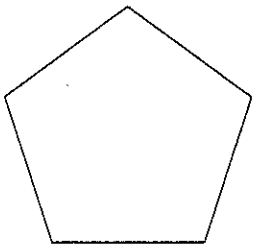
= 125g.

[3]

Examiner only

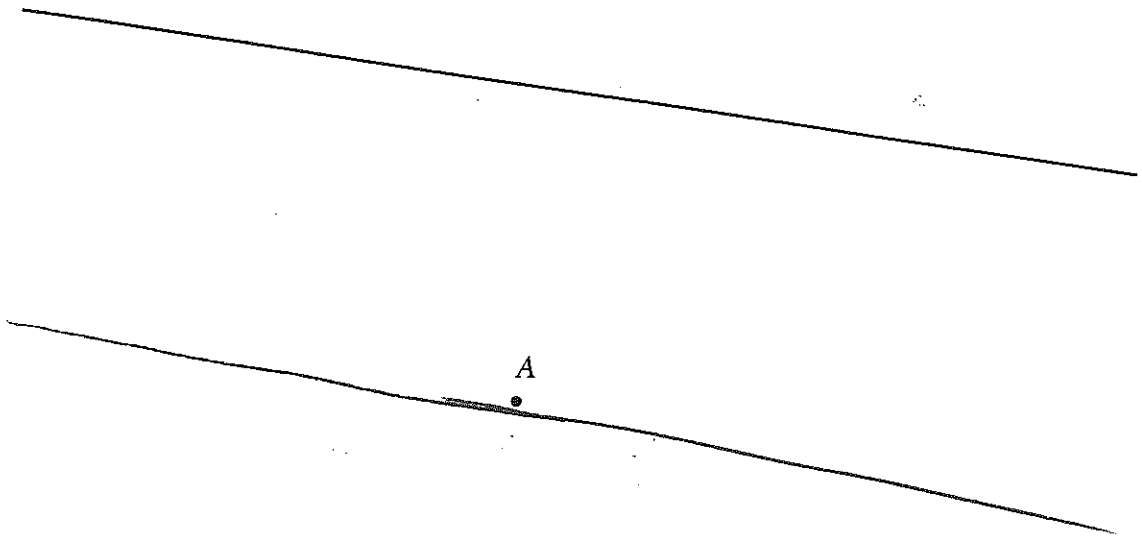
4. *(a)* Write down the names of each of the following figures.

[4]

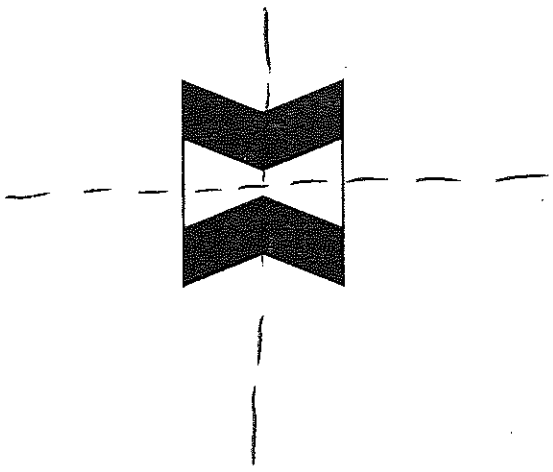
	Parallelogram
	Square base pyramid
	cylinder
	pentagon

Examiner only

(b) (i) In the diagram below, draw a line through the point *A* that is parallel to the given line.



(ii) Draw all the lines of symmetry on the following shape.



[3]

Examiner only

5. The formula for the cost of getting a person to do repairs is

Cost = Number of hours × £25 + Call Out Charge

(a) Find the **Cost** when the **Number of hours** is 5 and the **Call Out Charge** is £50.

$C = (5 \times 25) + 50$

$= 125 + 50$

$= £175$

[2]

(b) Find the **Call Out Charge**, when the **Cost** is £240 and the **Number of hours** is 8.

$240 = (8 \times 25) + x$

$240 - 200 = x$

$£40 =$ call out charge

[2]

6. Describe **in words** the rule for continuing **each** of the following sequences.

(a) 50, 45, 40, 35, ...

Rule: −5 subtract five from each term to get next term

[1]

(b) 2, 6, 18, 54, ...

Rule: multiply each term by three to get next term

[1]

Examiner only

7. The electricity meter readings at the beginning and the end of a period were:

Reading at the end of the period	6	6	7	5
Reading at the beginning of the period	6	5	4	3

The cost of the electricity is 13p per unit.
There is also a fixed charge of £22.25.
Complete the following table to find the total cost.

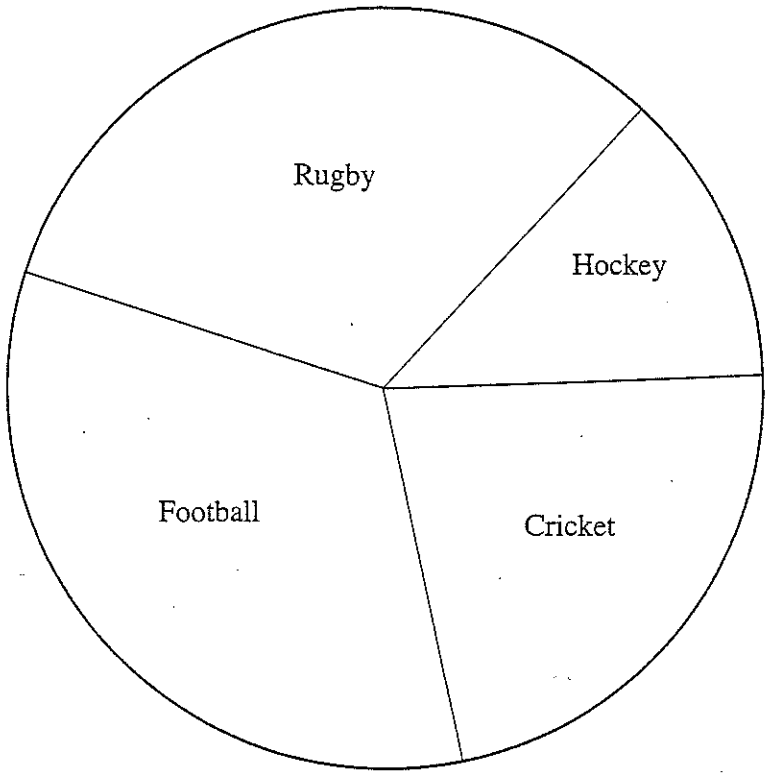
Reading at the end of the period	6675
Reading at the beginning of the period	6543
Number of units used	132
Cost of the units in £0·13 × 132	£17·16
Fixed charge	£22.25
Total cost	£39·41

132
13
396
1320
£17·16

[4]

Examiner only

8. Bryn carries out a survey to find out which of Rugby, Hockey, Cricket or Football each of 144 students preferred.
He uses the data obtained to draw the following pie chart.



(a) What **fraction** of the students answered 'Hockey'?

$\frac{45}{360} = \frac{1}{8}$

[2]

(b) **How many** of the students answered 'Football'?

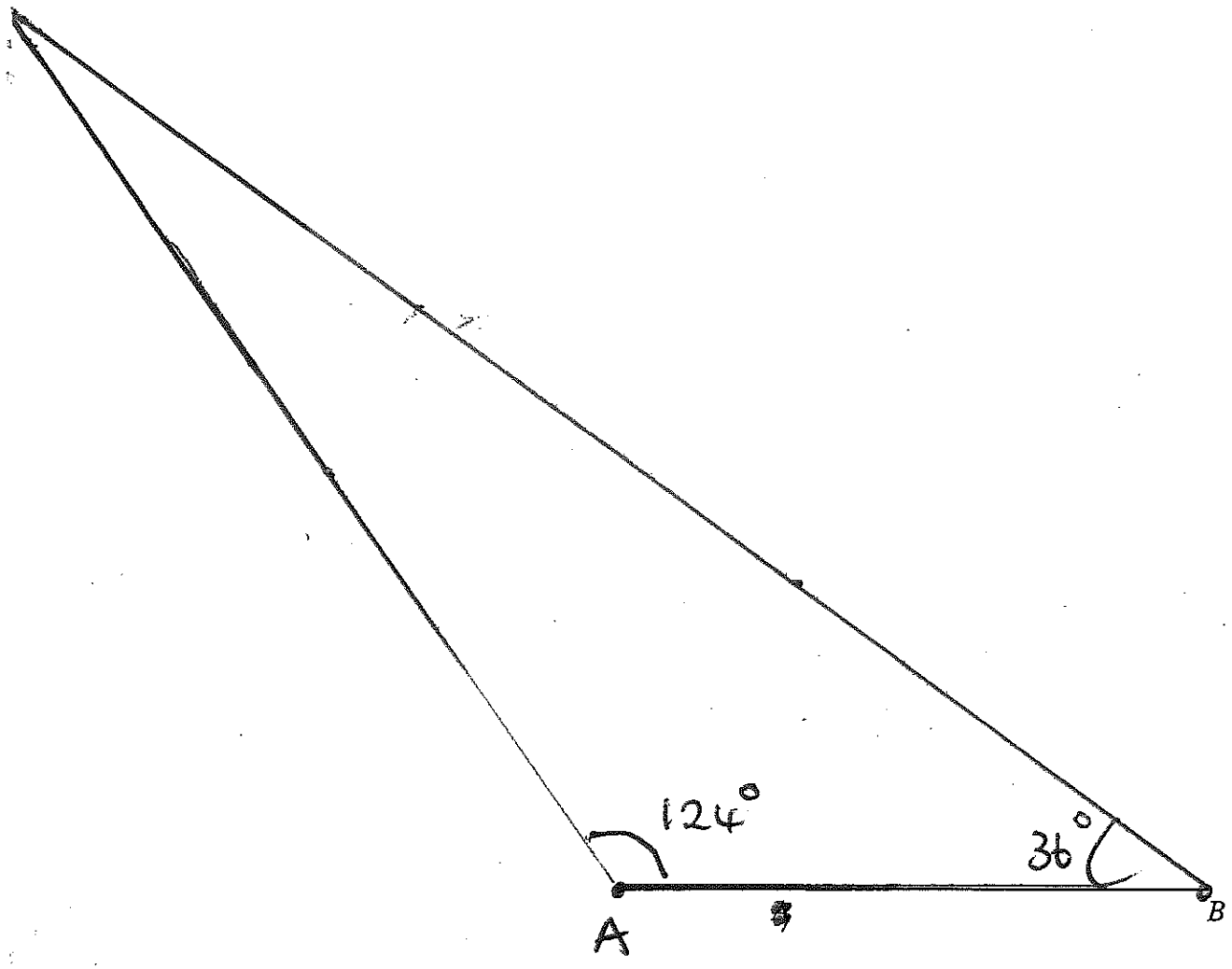
$\frac{1}{3}$ of 144 = 48

[2]

Examiner only

9. *(a)* Complete an accurate drawing of triangle ABC in which $AB = 6$ cm, angle $BAC = 124°$ and angle $ABC = 36°$.
The side AB has been drawn for you.

[3]



(b) Write down the special name given to an angle which is greater than 180° and less than 360°.

REFLEX

[1]

Examiner only

10.

The diagram illustrates a mountain that is partly above sea level and partly below sea level.

The point *A* is 500 m above sea level.
The point *C* is 100 m below sea level and its height is shown as −100 m on the diagram.

(a) On the diagram

(i) mark a point *X* that is 100 m above sea level,

(ii) mark a point *Y* that is 50 m below sea level.

[2]

(b) How much higher is the point *B* than the point *C*?

300 m

.....

.....

[1]

Examiner only

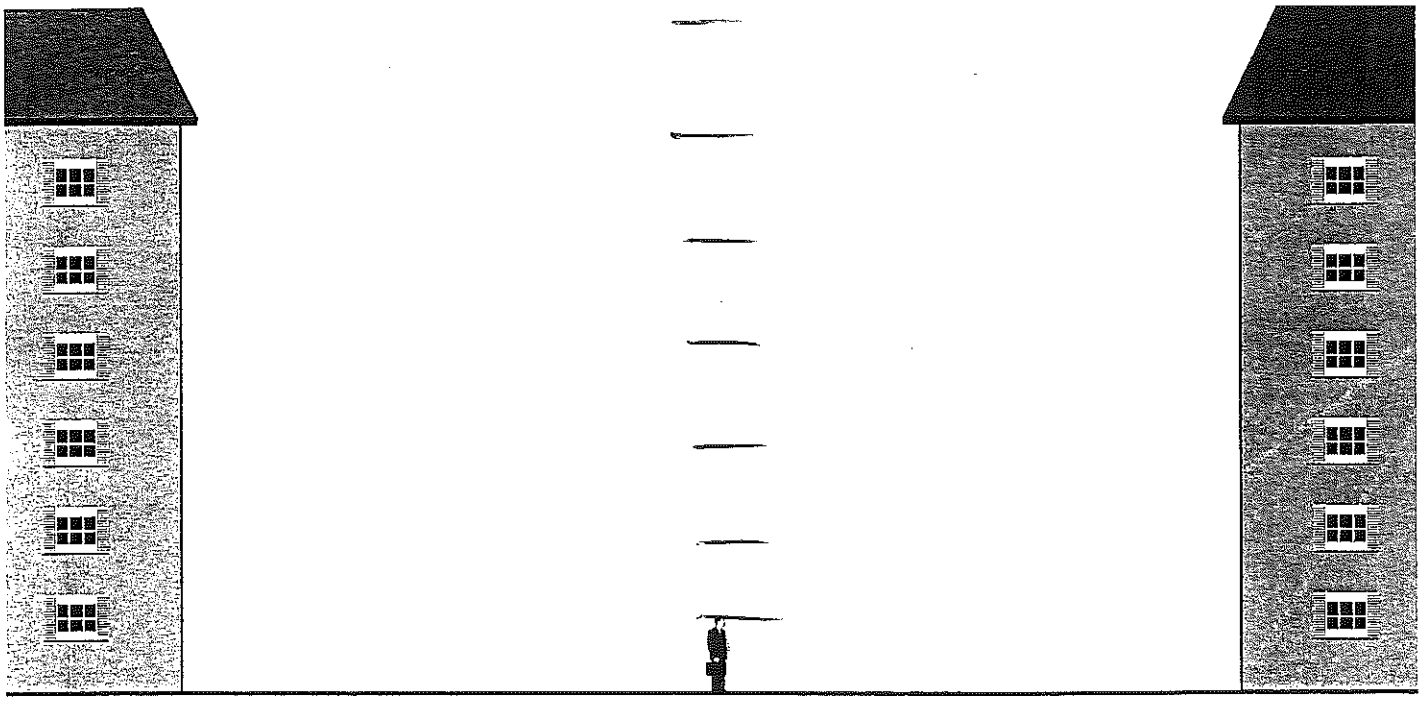
(c) The point E is 40 m below the level of D.
Write down its height above sea level.

$-220\,m$

[1]

Examiner only

11.



The above picture shows a man standing between two buildings.

Write down an **estimate** for the **actual height** of the man. 6ft

Using this estimate for the height of the man, estimate the **actual distance between the two buildings**.

You must show all your working.

÷0.8 = 12.5

10 ~~[illegible]~~ ~~[illegible]~~.

12.5 x 6 ft

= 75 ft.

[4]

Examiner only

12. *(a)* Simplify $4c + 2c + 3c$.

$9c$

[1]

(b) Solve each of the following equations.

(i) $3x = 15$

$x = 5$

(ii) $y + 7 = 13$

$y = 13 - 7$

$y = 6$

[2]

(c) Use the formula $R = 3V + 2T$ to find V when $R = 40$ and $T = 5$.

$40 = 3V + 10$

$30 = 3V$

$10 = V$

[3]

Examiner only

13. The price of a memory stick depends on its size and the number bought.
The table below shows the price of **one memory stick** of each size depending on the number bought.

	Number of memory sticks bought		
	1-2	3-5	6 or more
1GB memory stick	£3.49 each	£2.99 each	£2.49 each
2GB memory stick	£4.95 each	£4.49 each	£3.99 each
4GB memory stick	£8.95 each	£7.99 each	£7.49 each

(a) Calculate the total cost of buying eight 4GB memory sticks.

$8 \times 7.49 = £59.92$

[2]

(b) How much cheaper would it be to buy five 2GB memory sticks altogether, than to buy them one at a time?

$5 \times 4.49 = £22.45$

$5 \times 4.95 = £24.75$

$\therefore £2.30$

[2]

Examiner only

14. Forty unrelated girls are asked how many brothers they have.
The results are summarised in the following table.

Number of brothers	0	1	2	3	4
Frequency	10	19	6	4	1

(a) What is the probability that a randomly chosen girl from this group has at least 2 brothers?

$P(\text{at least } 2) = \frac{11}{40}$

[2]

(b) How many brothers did these girls have altogether?

$6 \times 2 + 4 \times 3 + 4$

$= 12 + 12 + 4$

$= 28$

[2]

Examiner only

15. *(a)* In an opinion poll 84 people out of the 125 questioned said they preferred a certain candidate.
What percentage is this?

$\frac{84}{125}$

$= 67{\cdot}2\%$

[2]

(b) Evaluate $4{\cdot}3^2 + \sqrt{31{\cdot}36}$.

$18{\cdot}49 + 5{\cdot}6$

$= 24{\cdot}09$

[1]

(c) The total cost of 1·5 kg of bananas and 0·6 kg of grapes is £3.99.
Bananas cost £1.24 per kg.
Find the cost of 1 kg of the grapes.

$(1{\cdot}24 \times 1{\cdot}5) = £1{\cdot}86$

$3{\cdot}99 - 1{\cdot}86 = 2{\cdot}13$

[4]

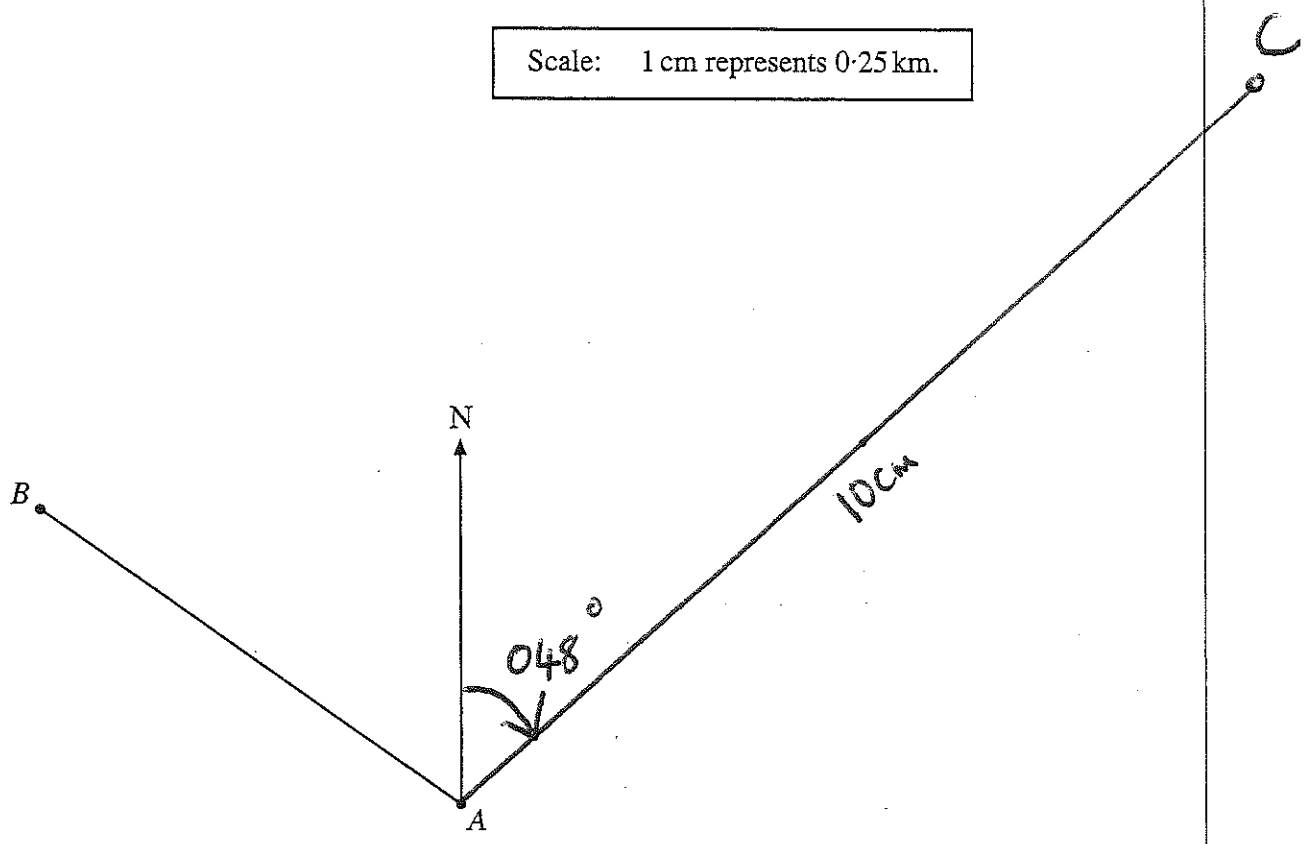
$\therefore 2{\cdot}13 = 0{\cdot}6$ kg grapes

$\frac{2{\cdot}13}{6} \times 10 = 1$ kg grapes

£3·55

Examiner only

16. *(a)* Below is a section of a map.



Find the actual distance, in km, from A to B.

$4{\cdot}8\text{cm} = 4{\cdot}8 \times 0{\cdot}25$

$=$

Distance, in km, from A to B is 1·2 km

[3]

(b) Plot the point C which is $2\frac{1}{2}$ km from A on a bearing of 048°.

[2]

$2\frac{1}{2}\text{km} = 10\text{cm}$

Examiner only

17. In the diagram below, *ABCD* is a rectangle.

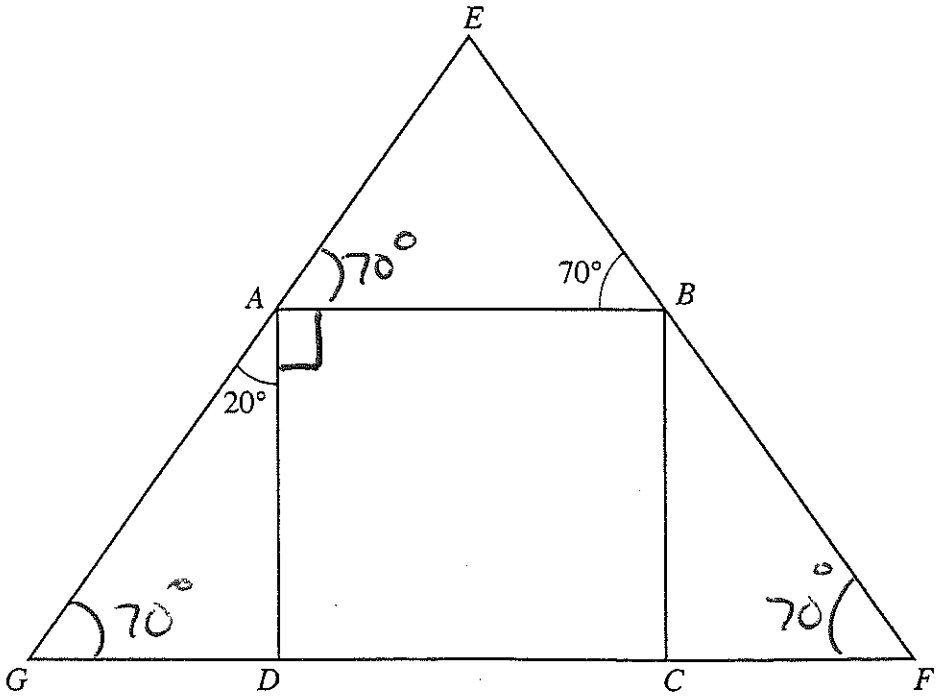


Diagram not drawn to scale.

Explain why triangle *EFG* is isosceles.

$20 + 90 = 110 \quad \therefore \quad x = 70^\circ$

$\therefore$ Top $\triangle$ is isosceles.

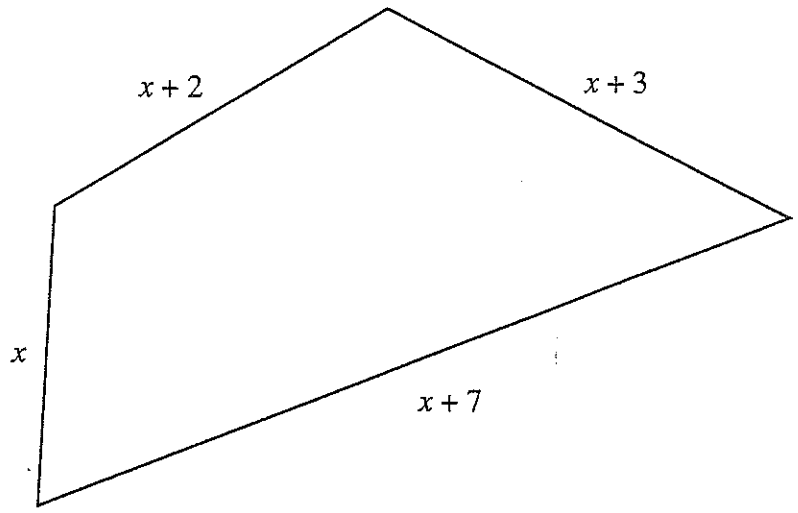
We have similar $\triangle$'s because of parallel lines.

$\therefore$ EFG is isosceles.

[4]

Examiner only

18. The diagram shows a quadrilateral.
The lengths of the sides are all given in centimetres.



(a) Write an expression for the perimeter of the quadrilateral in terms of x.

$x + x + 2 + x + 7 + x + 3$

$= 4x + 12$

[1]

(b) (i) The perimeter of the quadrilateral is 40 cm.
Write down an equation in terms of x.

$4x + 12 = 40$

(ii) Solve the equation.

$4x = 28$

$x = 7$

[2]

(c) Write down the lengths of the four sides of the quadrilateral.

7, 9, 10, 14 cm.

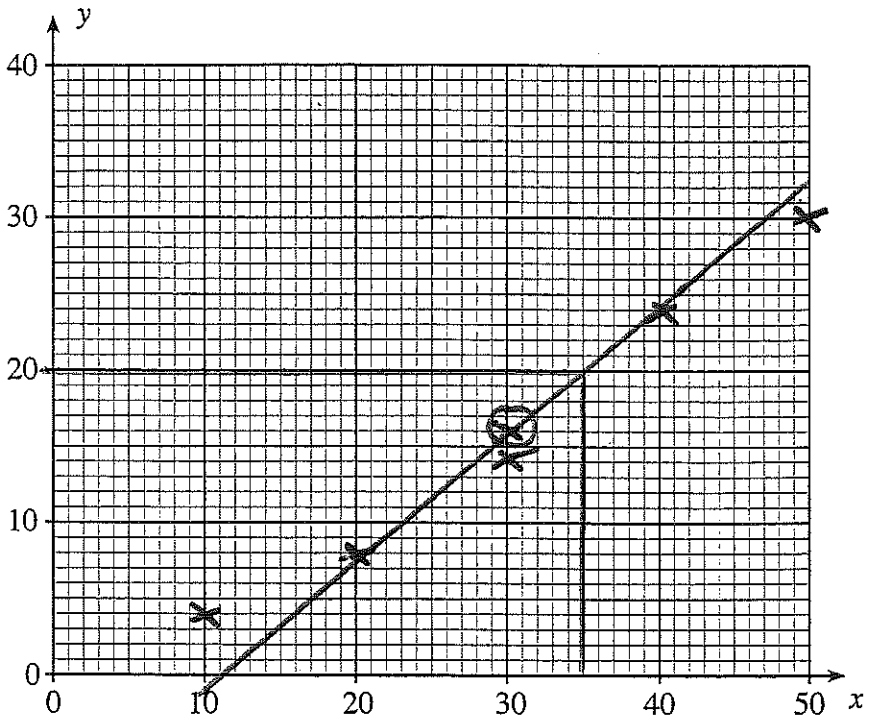
[1]

Examiner only

19. In a science experiment, values of x and y are recorded to look for a relationship. The table below shows the results.

x	20	50	10	40	30
y	8	30	4	24	14

(a) On the grid below, draw a scatter diagram to show these results.



[2]

(b) The mean of the x values is 30.

(i) Calculate the mean of the y values.

$\frac{8+30+4+24+14}{5} = 16$

(ii) Draw the line of best fit on your scatter diagram.

[4]

(c) Which type of correlation does your scatter diagram show?

POSITIVE

[1]

(d) Write down an approximate value for y when x is 35.

20

[1]

Examiner only

20. *(a)* Factorise $4x - 6$.

$2(x-3)$

[1]

(b) Make r the subject of the formula $m = 9r + 4$.

$\frac{m-4}{9} = r$

[2]

(c) Solve the inequality $6x > 2x + 9$.

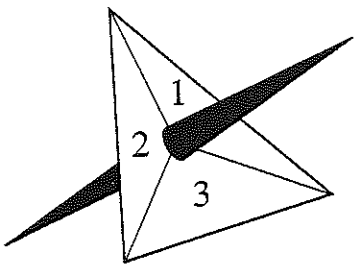
$6x - 2x > 9$

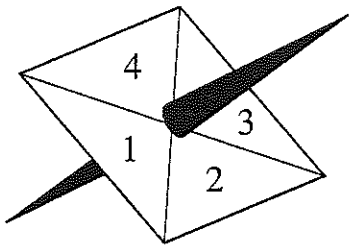
$4x > 9$

$x > 9/4$

[2]

21. A triangular shaped spinner has the numbers 1, 2 and 3 written on its three equal sections.
A square shaped spinner has the numbers 1, 2, 3 and 4 written on its four equal sections.





Each spinner is spun once.
Calculate the probability that the spinners will both show 3.

$P(3 \text{ and } 3)$

$= \frac{1}{3} \times \frac{1}{4}$

$= \frac{1}{12}$

[3]

Examiner only

22.

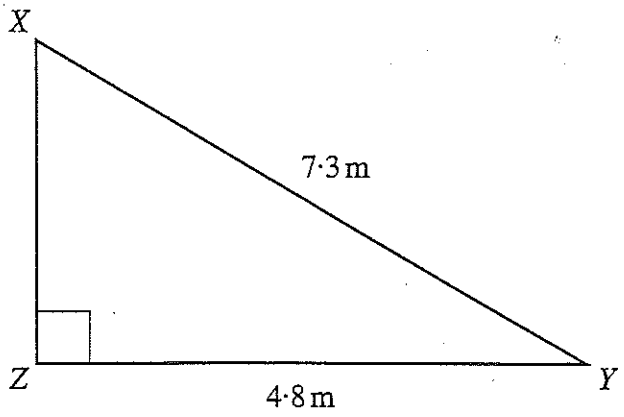


Diagram not drawn to scale.

XYZ is a right-angled triangle in which $XY = 7{\cdot}3$ m and $ZY = 4{\cdot}8$ m.
Calculate the length of *XZ*.

$h^2 = a^2 + b^2$

$7{\cdot}3^2 = 4{\cdot}8^2 + b^2$

$\sqrt{53{\cdot}29 - 23{\cdot}04} = b$

$\sqrt{30{\cdot}25} = b$

$5{\cdot}5\text{m} = b$.

[3]