Candidate Name	Centre Number	Candidate Number
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WJEC CBAC

GCSE

185/08

SOLUTIONS

MATHEMATICS
FOUNDATION TIER
PAPER 2

A.M. FRIDAY, 12 November 2010

2 hours

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

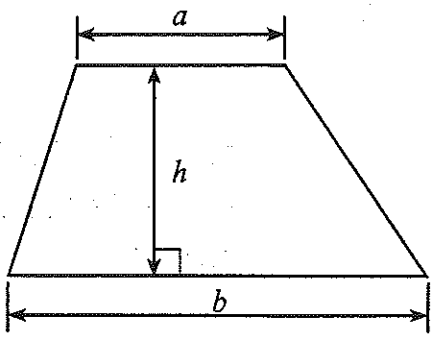
Unless stated, diagrams are not drawn to scale.

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

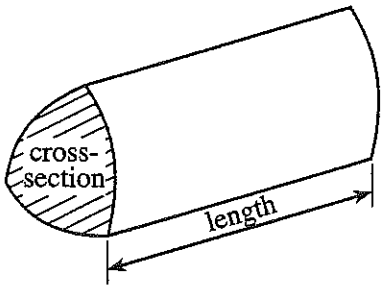
The number of marks is given in brackets at the end of each question or part-question.

Formula List

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



Volume of prism = area of cross-section × length



Examiner only

1. *(a)* (i) Complete the following bill.

Item	Cost
3 kg of apples @ £1.35 per kg	£ 4.05
4 jars of jam @ £1.31 each	£ 5·24
3 kg leeks @ £1.62 per kg	£ 4·86
500 g mushrooms @ 25p per 100 g	£ 1·25
Total	£ 15·40

(ii) Chris gets a 5% discount.
How much discount does he get off the bill?

$\frac{15{\cdot}40}{100} \times 5 = £0{\cdot}77$

[6]

(b) Mr. Hughes buys a newspaper costing 35p every day from Monday to Friday for 4 weeks.
How much does this cost altogether?

$5 \times 35 \times 4$

$= 700$

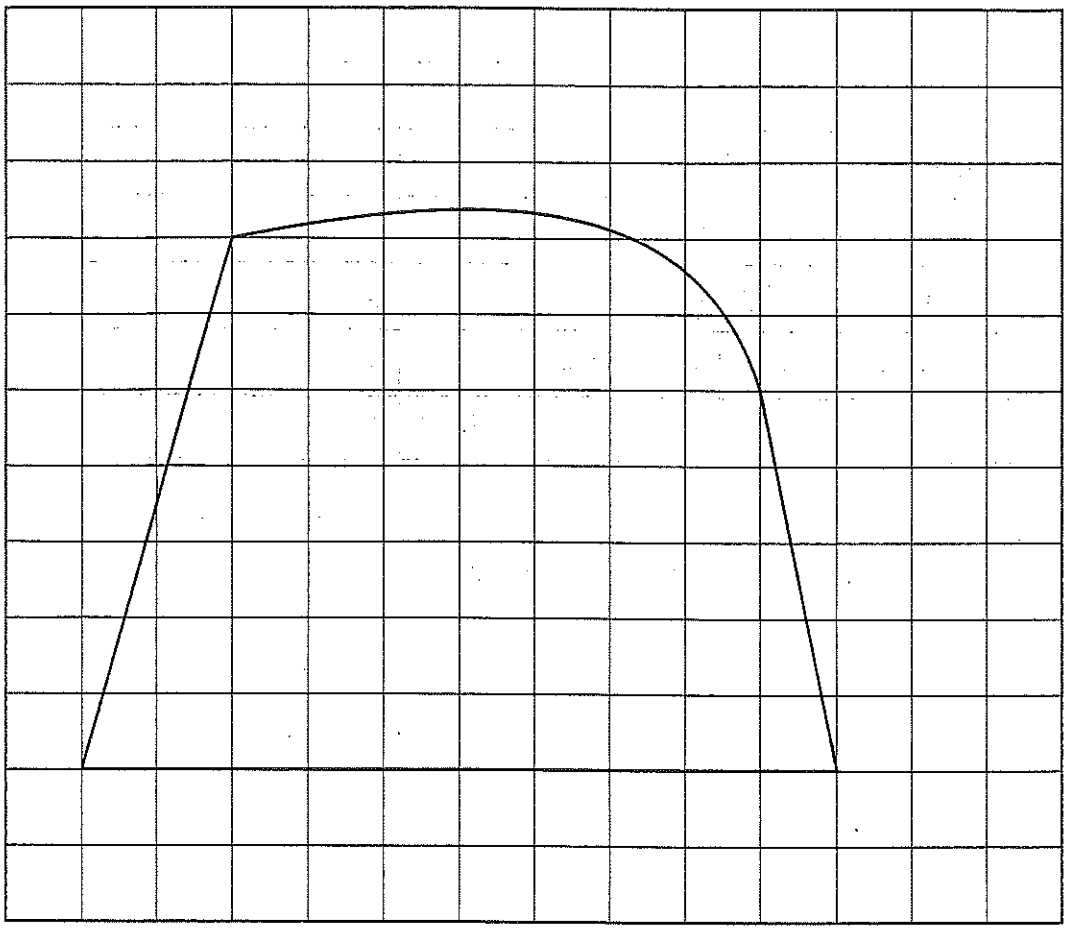
$= £7{\cdot}00$

[2]

8

Examiner only

2. *(a)*



The above shape has been drawn on a square grid.
By counting squares, estimate the area of the above shape.

.....

.....

.....

.....

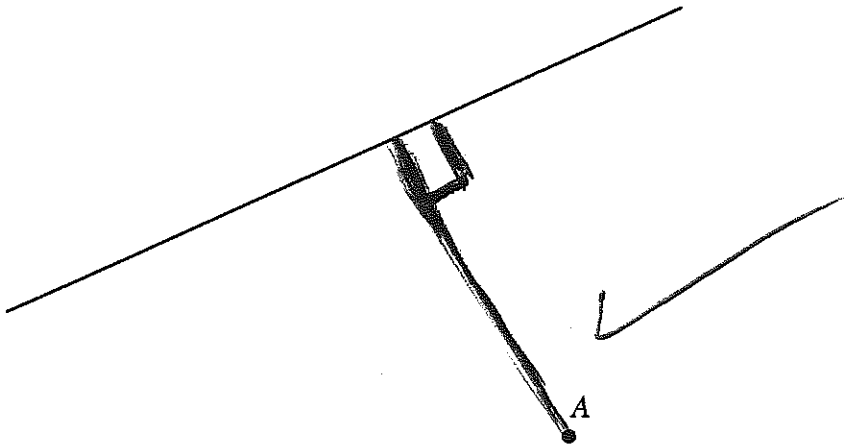
Area of the shape = 58 cm² .....

[2]

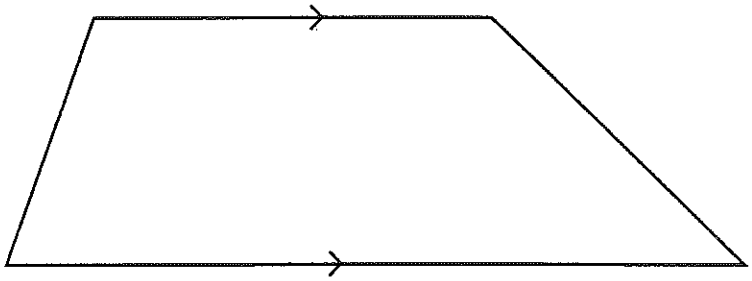
2

Examiner only

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



(ii) Write down the name of the following shape.



trapezium

[2]

2

Examiner only

3. The table shows the postal charges for using the Special Delivery (next day) service offered by the Post Office.

Special Delivery Postage Calculator

	Next day delivery on			
	Monday – Friday		Saturday	
Weight not over	by 9 a.m.	by 1 p.m.	by 9 a.m.	by 1 p.m.
100 g	£10.85	£4.95	£13.05	£7.15
500 g	£12.65	£5.40	£14.85	£7.60
1 kg	£14.75	£6.70	£16.95	£8.90
2 kg	£18.30	£8.65	£20.50	£10.85
10 kg		£21.65		£23.85

(a) Alice posts a package that weighs 400 g on Tuesday for delivery by 9 a.m. the next day.
How much did it cost?

£12.65

[1]

(b) A package weighs 850 g.
It is posted on Thursday.
How much more does it cost to send this package to be delivered by 9 a.m. the next day rather than by 1 p.m. the next day?

14.75 − 6.70

= £8.05

[3]

(c) John goes to the Post Office on a Friday.
He wants to post a package weighing 7 kg which **must** arrive by the next day and by 9 a.m. if possible.
Explain **fully** what John should be told at the Post Office about delivery and cost.

Can't be delivered by 9.00 am only by 1pm for £23.85

[2]

Examiner only

4. The diagram shows a scale with 10 and 70 marked on it.
Find the values that should be shown on the scale at the points marked *A*, *B*, *C* and *D*.

A = 40

B = 110

C = 0

D = -50

[4]

5. The formula for the cost of buying a television on credit is

Cost of buying a television = 36 × Monthly payment + Deposit

(a) Find the **Cost of buying a television** when the **Monthly payment** is £40 and the **Deposit** is £30.

$C = 36 \times 40 + 30$

$C = 1440 + 30$

$C = £1470$

[2]

(b) Find the **Deposit**, when the **Cost of buying a television** is £1330 and the **Monthly payment** is £35.

$1330 = 36 \times 35 + D$

$1330 - 1260 = D$

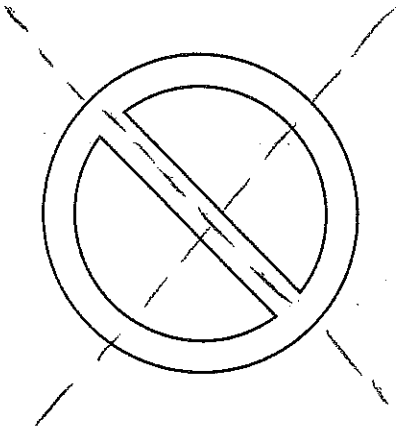
$£70 = D$

[2]

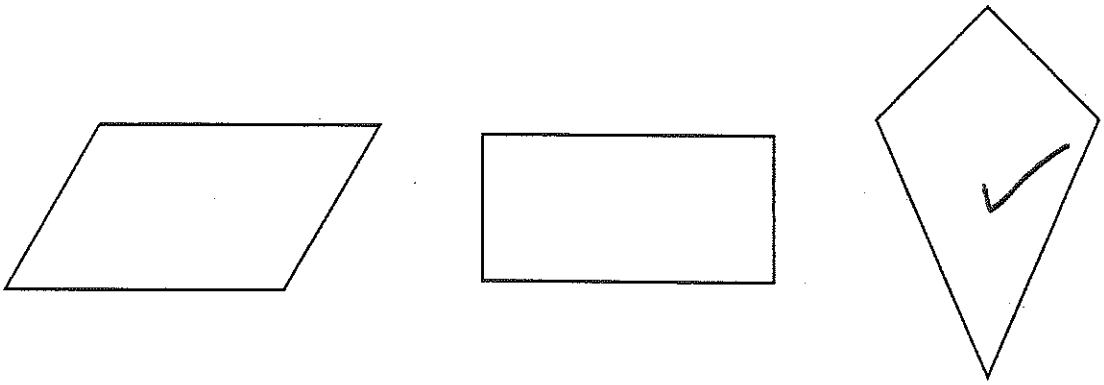
Examiner only

6. *(a)* Draw **all** the lines of symmetry on the following shape.

[2]



(b) (i) Tick (✓) the shape that has exactly one line of symmetry.



(ii) Write down the name of the shape that you ticked.

KITE

[2]

(c) Find the size of the angle marked x.

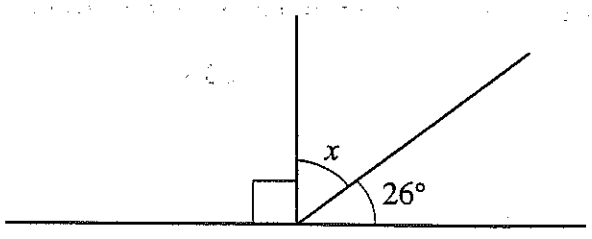


Diagram not drawn to scale

180 - 90 - 26

$x =$ 64 °

[2]

Examiner only

7. *(a)* Complete an accurate drawing of triangle PQR in which $QR = 12\,\text{cm}$, $PQ = 9\,\text{cm}$ and angle $PQR = 54°$
The side QR has been drawn for you.

[3]

(b) Write down the special name given to angles which are more than 90° and less than 180°.

OBTUSE

[1]

Examiner only

8. Complete the following table.
The first row has been completed for you.

Place	Temperature at 10 p.m.	Change	Temperature at 10 a.m. next day
Aberystwyth	−1 °C	Up 4 °C	3 °C
Bangor	−3 °C	Up 3°C	0 °C
Cardiff	−4 °C	Down 3 °C	−7°C
Denbigh	−5°C	Up 4 °C	−1 °C

[3]

9. The numbers of pupils on eight school buses are:

45 36 14 41 29 52 18 37

(a) Find the mean number of pupils on a bus.

$$\frac{45+36+14+41+29+52+18+37}{8}$$

$$= \frac{272}{8}$$

$$= 34$$

[3]

(b) Find the range of the number of pupils on a bus.

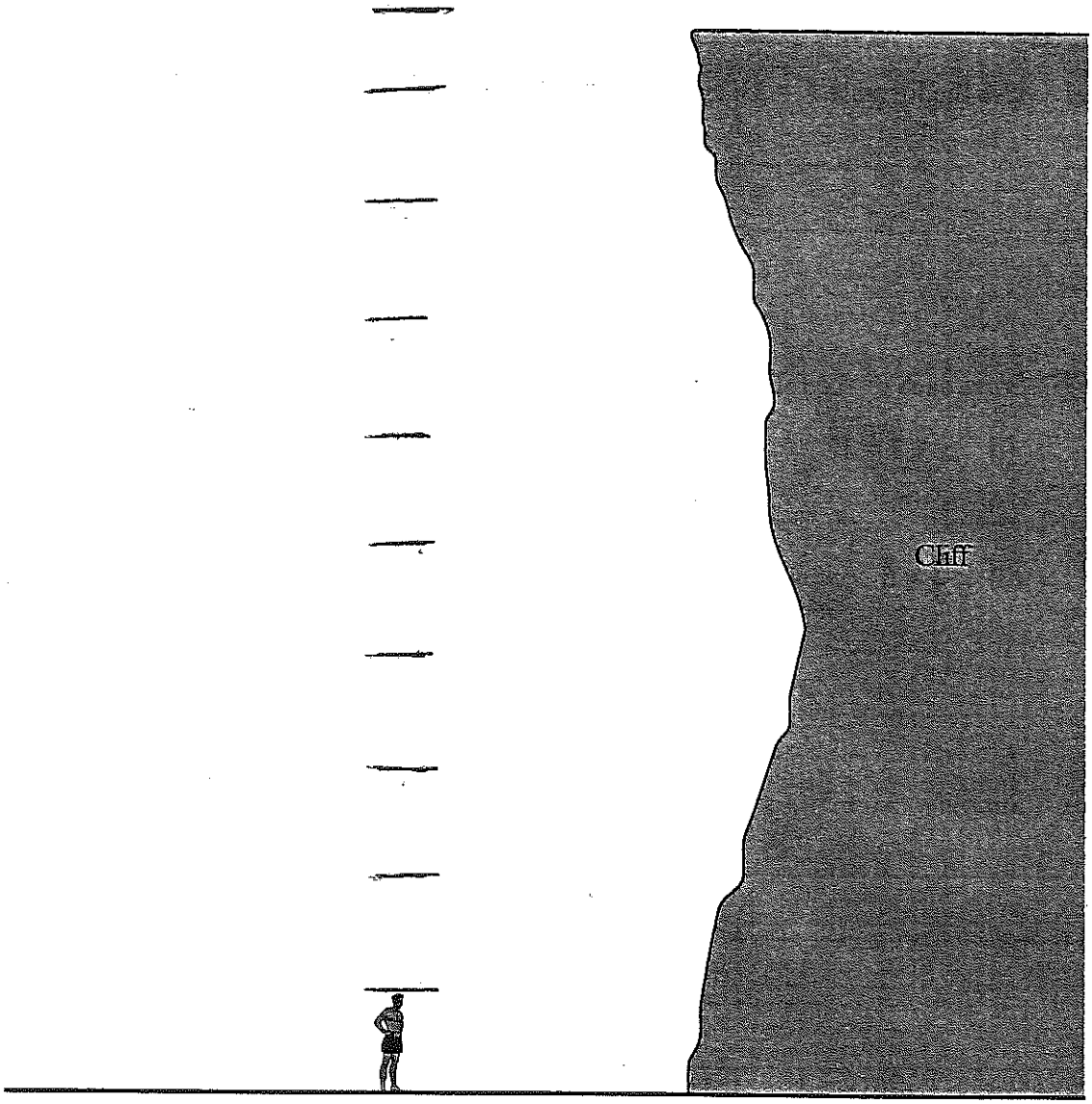
$$52 - 14$$

$$= 38$$

[1]

Examiner only

10.



The above picture shows a man standing on a beach in front of a cliff.

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

Using this estimate for the height of the man, estimate the **actual height** of the cliff, **showing all your working**.

10 x 6 ft

≈ 60 ft.

[4]

Examiner only

11. *(a)* Use the formula $F = 3W + 2T$ to find the value of F when $W = 8$ and $T = 6$.

$F = 24 + 12$

$F = 36$

[2]

(b) Solve **each** of the following equations.

(i) $x + 7 = 12$

$x = 5$

(ii) $\frac{y}{3} = 6$

$y = 18$

[2]

(c) Simplify $3x + 5y - x + 2y$.

$2x + 7y$

[2]

Examiner only

12. The number of sweets in each of 50 bags is counted.
The results are summarised in the following table.

Number of sweets	23	24	25	26	27
Frequency	9	12	16	10	3

(a) What is the probability that a randomly chosen bag has at least 25 sweets in it?

$\frac{29}{50}$ = [illegible]

[2]

(b) How many sweets are there altogether?

$9 \times 23 + 12 \times 24 + 16 \times 25 + 10 \times 26 + 3 \times 27$

$= 207 + 288 + 400 + 260 + 81$

$= 1236$

[2]

13. The total cost of 2·5 kg of apples and 1·4 kg of pears is £6.72.
The cost of 1 kg of pears is £1.55.
Find the cost of 1 kg of apples.

Pears $1.4 \times 1.55 = £2.17$

$\therefore$ Apples $= 6.72 - 2.17$

$= £4.55$ for 2.5 kg

$\therefore \frac{4.55}{2.5} = £1.82$ / kg.

[4]

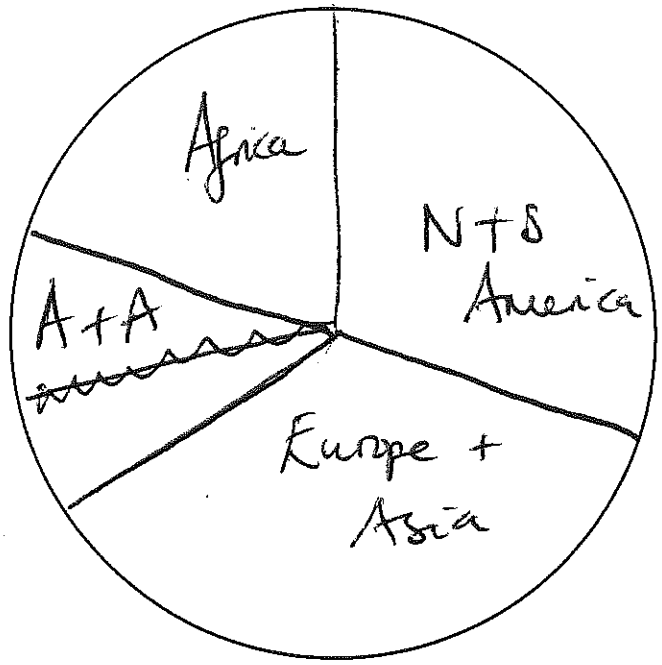
Examiner only

14. The table shows the continents in four groups and the approximate area of each group.

Group	Area in million square miles
North and South America	17
Europe and Asia	22
Australia and Antarctica	9
Africa	12

60

Draw a pie chart to illustrate these data. You should show how you calculate the angles of your pie chart.



60 = 360°

1 = 6°

N+S America = 17 x 6 = 102°

Europe + Asia = 22 x 6 = 132°

Australia + Ant = 9 x 6 = 54°

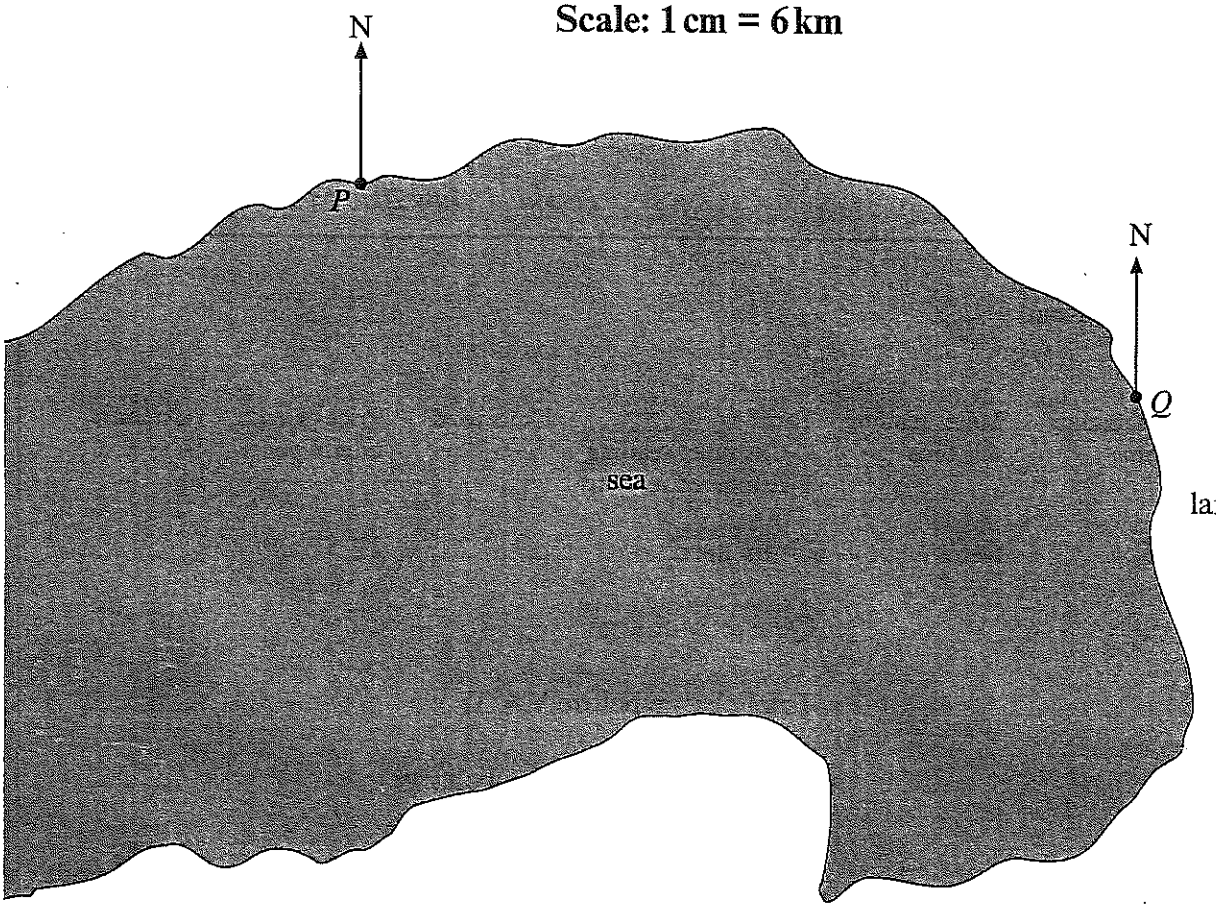
Africa = 12 x 6 = 72°

360°

[4]

Examiner only

15. *(a)* Two ports P and Q are shown on the map below, which is drawn to scale. Find the **actual** distance between the two ports.



7.5 x 6
= 45 Km

[3]

(b) A ship is on a bearing of 152° from P and at a distance of 48 km from Q. Plot the position of the ship and mark it X.

[2]

$\frac{48}{6} = 8\text{cm}$

Examiner only

16. Mr. Williams' electricity account with Energy UK, with some of the entries removed, is shown below.
He pays for his electricity by monthly direct debit payments. He gets a discount of £26.25 for paying in that way. Use the information given on the account to complete all of the missing entries and to calculate the balance in Mr Williams' account.

Energy UK **Electricity Account**

Period: 1st July 2010 to 30th September 2010

Mr. Williams
54 Alder Road
Cardiff

Meter reading last time	Meter reading this time	Tariff C-Customer reading E-Estimated reading	Units used	Price of each unit in pence	Amount £
4865	**6469**	Units used	1604	12.5	200.50 ~~20.05~~
		Quarterly charge			30.26
		Total charge before V.A.T.			230.76
		V.A.T. at 5% of the total charge			11.54 ~~2.52~~
		Balance from previous quarter			17.82
		Total to pay			224.48 ~~35.31~~
		Payments received			
		Direct Debit Discount			26.25 **CR**
		Payment received 28th July 2010			80.00 **CR**
		Payment received 28th August 2010			80.00 **CR**
		Payment received 28th September 2010			80.00 **CR**
		Balance to carry forward to next quarter			£ ~~25.24~~ £ 41.77

Working.

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.....

.....

[6]

Examiner only

17. Before travelling to Germany, Nicky filled the fuel tank of her car with 40 litres of petrol which cost £44.
Nicky also bought some euros for her trip. The exchange rate was £1 = 1.15 euros.
In Germany, she needed to buy another 40 litres of petrol which cost 0.98 euros per litre.
How much less did the 40 litres of petrol cost in Germany?
Give your answer in euros.

Before £44

Germany $40 \times 0.98 = 39.2$ €

$\frac{39.2}{1.15} = £34.09$

∴ £9.91 cheaper

$= 9.91 \times 1.15$

$= 11.40$ € [5]

Examiner only

18. *(a)* Complete the table.

$3x$	33
x	11
$2c - 3$	17
c	10
$c - a$	3
a	7
$a + b$	12
b	5
$c + b$	15

[4]

(b) The nth term of a sequence is $n^2 + 3$.
Write down the first three terms of the sequence.

$1^2+3 = 4$

$2^2+3 = 7$

$3^2+3 = 12$

[2]

(c) Write down the nth term of the sequence 8, 15, 22, 29, 36, ...

+7 +7 +7

$7n + 1$

[2]

Examiner only

19. Jane says that when throwing two fair £1 coins the probability of two heads is greater than the probability of two tails. Is this true? Justify your answer by finding the probabilities of these outcomes.

No.

$P(H \text{ and } H) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$P(T \text{ and } T) = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

[3]

20. The number of days taken to germinate 60 seeds was recorded.
The table shows a grouped frequency distribution of this information.

Time, d days	Number of seeds	Mid
$1 \leqslant d \leqslant 7$	15	4
$8 \leqslant d \leqslant 14$	33	11
$15 \leqslant d \leqslant 21$	12	18

Find an estimate for the mean time taken for a seed to germinate.

$$\frac{(15 \times 4) + (33 \times 11) + (12 \times 18)}{60}$$

$$= \frac{60 + 363 + 216}{60}$$

$$= \frac{639}{60} = 10.65 \text{ days}$$

[4]

Examiner only

21. A solution to the equation $x^3 + x - 1 = 0$ lies between 0 and 1.
Use the method of trial and improvement to find this solution correct to one decimal place.

$0.5 \quad 0.5^3 + 0.5 - 1 = -0.375$ Too small

$0.7 \quad 0.7^3 + 0.7 - 1 = +0.043$ Too big

$0.6 \quad 0.6^3 + 0.6 - 1 = -0.184$ Too small.

$0.65 \quad 0.65^3 + 0.65 - 1 = -0.075$ Too small

$\therefore \quad x = 0.7$ to 1 d.p.

[4]