Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

GCSE

4370/04

SOLUTIONS

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. MONDAY, 17 June 2013

$1\frac{3}{4}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

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.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

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 when appropriate.

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.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question **12**.

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

4370 040001

Examiner only

1. *(a)* Kevin orders some items from a butcher.
Complete the **four** entries in the following table to show his bill for these items.

Amount	Item	Cost (£)
4·5 kg	Beef @ £8.98 per kg	40.41
9 packs	Sausages @ £4.39 per pack	39.51
8 packs	Stuffing @ 38p per pack	3.04
12	Steaks @ £6.32 each	75.84
Total		158.80

304 ÷ 38

[4]

(b) He gets a 20% discount. Same as ÷ 5
How much is this discount?

158.80 ÷ 5

= £31.76

[2]

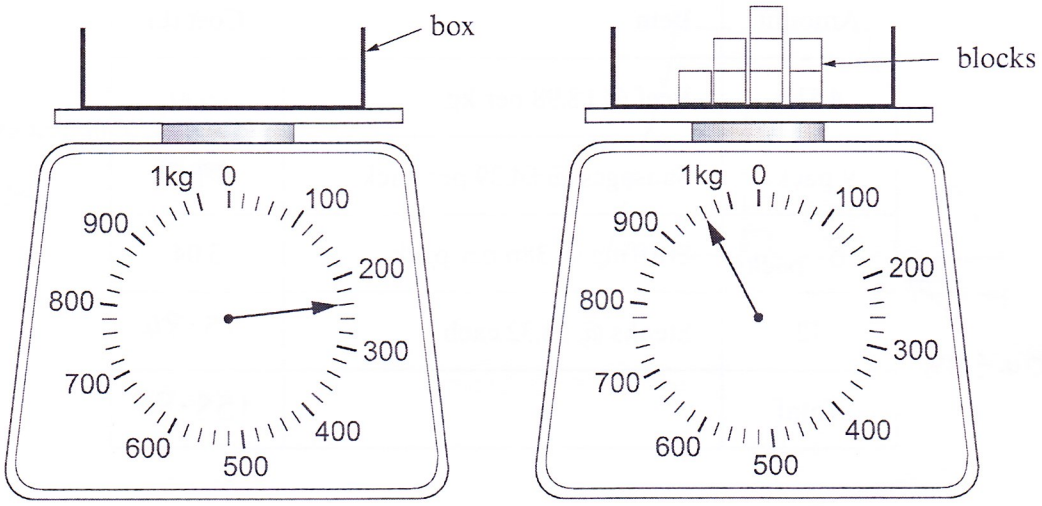
2. Circle the quantity that is the appropriate estimate for each of the following.

Length of a football pitch	120 km	120 m	120 mm	120 cm
Weight of a man	80 kg	80 g	80 mg	800 kg
Capacity of a cup	2 litres	10 cm^3	200 ml	1 ml
Area of a page in a book	4 m^2	400 cm^2	40 mm^2	400 cm^3

[4]

Examiner only

3. A box is placed on a scale.
8 identical blocks are then placed in the box.



Find how much one block weighs.

8 Blocks = 960 - 240

8b = 720

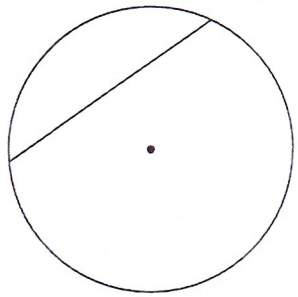
$b = \frac{720}{8}$

b = 90g

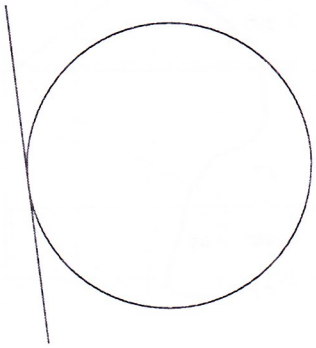
[3]

Examiner only

4. *(a)* Write down the special name of the straight line shown in each of the following diagrams.



chord



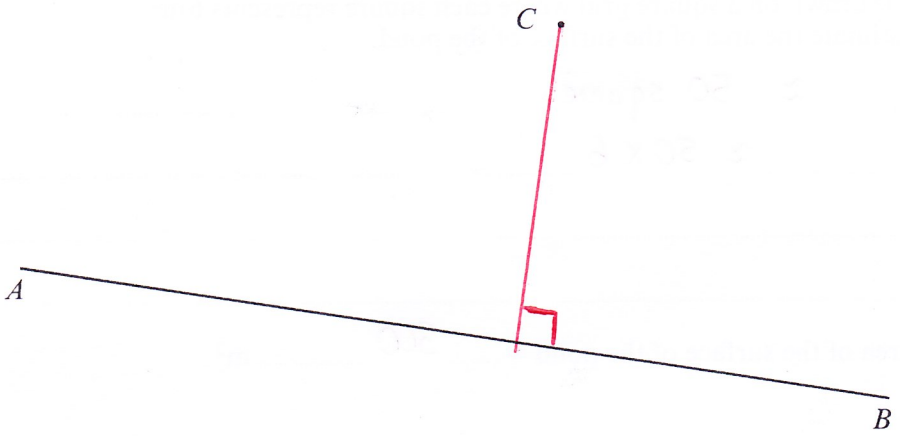
tangent

[2]

(b) (i) Measure, in centimetres, the length of the line AB in the diagram below.

Length of AB = 11·6 cm

[1]

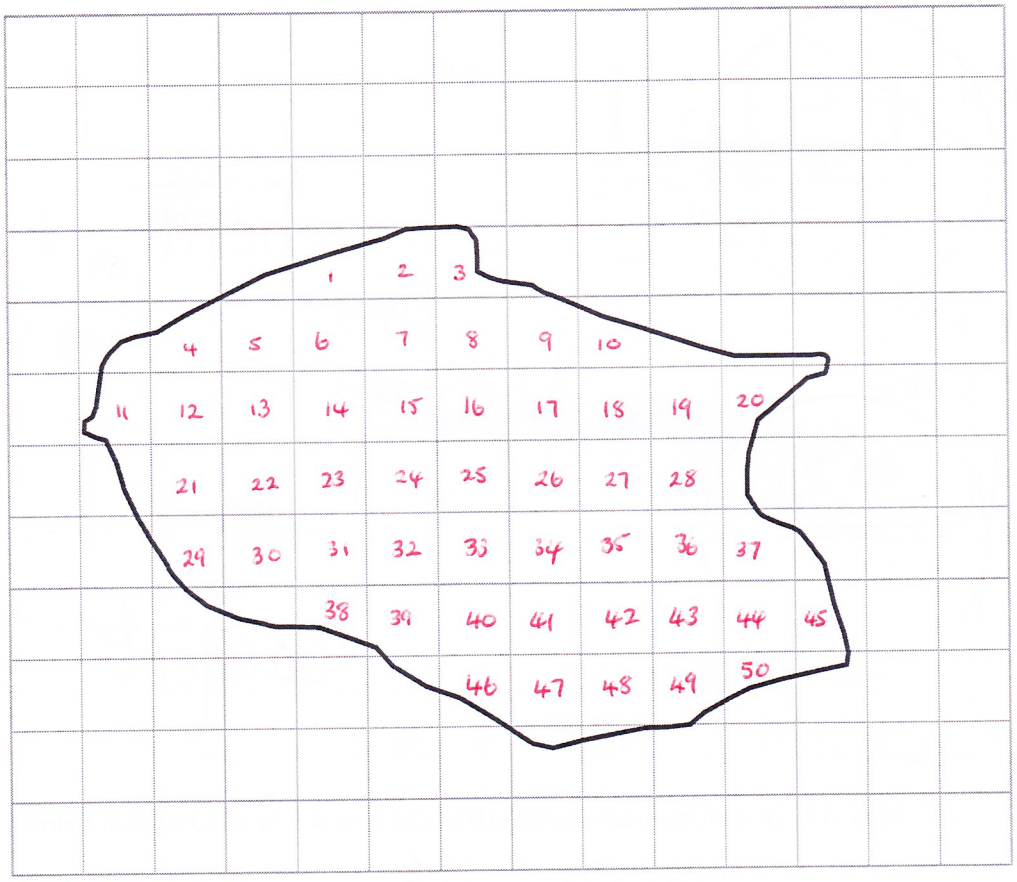


(ii) Draw a line perpendicular to AB that passes through C.

[1]

Examiner only

5. *(a)*



The above shape is the outline of a pond in a park.
It is drawn on a square grid where each square represents $6\,m^2$.
Estimate the area of the surface of the pond.

≈ 50 squares

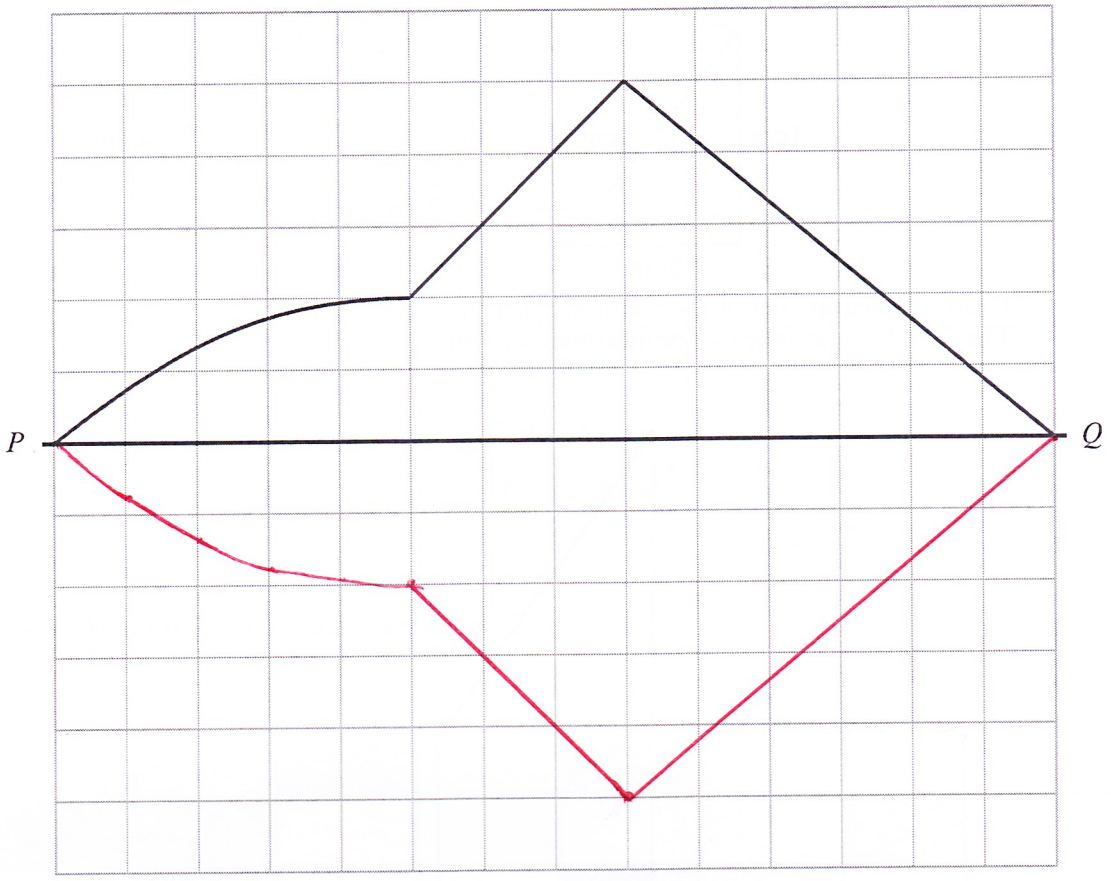
≈ 50 × 6

Area of the surface of the pond = 300 m^2

[3]

Examiner only

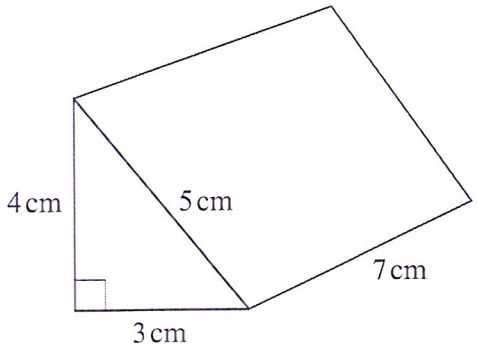
(b) Complete the following figure so that it is symmetrical about the line PQ.



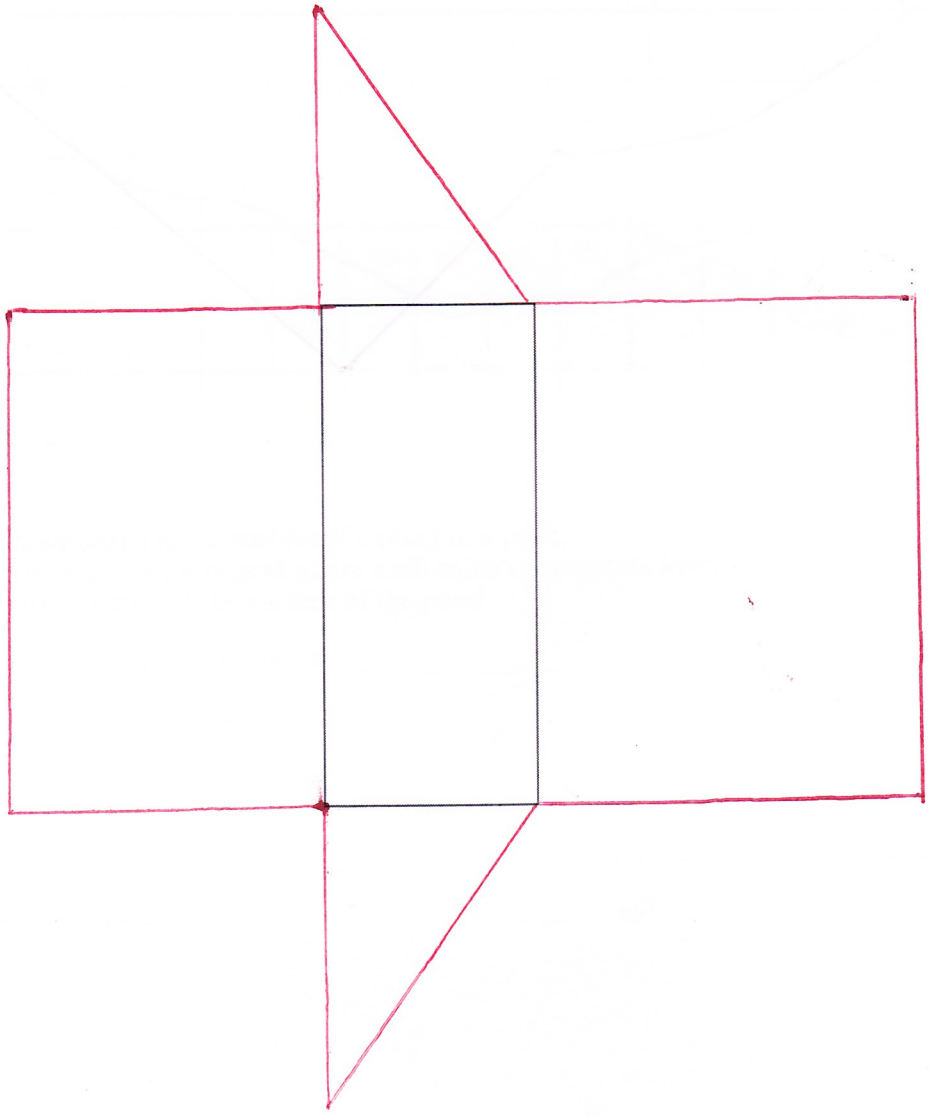
[2]

Examiner only

6. The diagram shows a sketch of a triangular prism.



Draw an **accurate** net of the triangular prism.
The 7 cm by 3 cm face has been drawn for you.



[4]

Examiner only

7. *(a)* Draw a circle around all of the following fractions that are equal to 0·6.

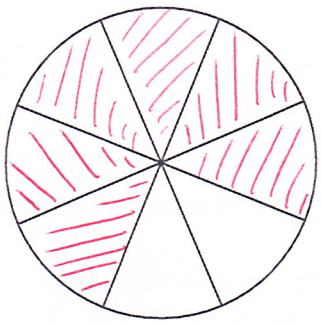
$\frac{12}{20}$ $\frac{1}{6}$ $\frac{9}{15}$ $\frac{6}{10}$ $\frac{5}{20}$

[2]

(b) Shade 75% of the following figure.

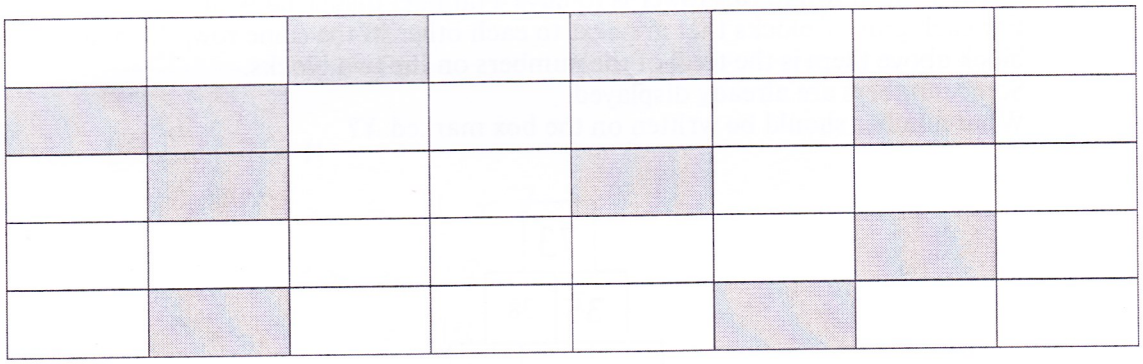
$= \frac{3}{4}$

$= \frac{6}{8}$



[1]

(c) What fraction of the following shape is shaded?
Give your answer in its **simplest form**.



$\frac{10}{40} = \frac{1}{4}$

[2]

Examiner only

8. *(a)* Complete the following table, which shows the temperature at 11:00p.m., the change in temperature and the temperature at 11:00a.m. the next day, in each of three places. The first one has been done for you.

Place	Temperature at 11:00p.m.	Change	Temperature at 11:00a.m. next day
Swansea	−1°C	Up 4°C	3°C
New York	−2°C	Up 2°C	0°C
Moscow	−8°C	Up 5°C	−3°C

[2]

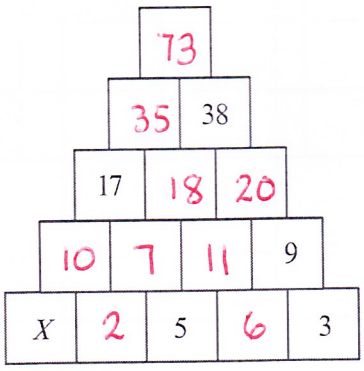
(b) Calculate 53% of 82.

82 ÷ 100 x 52

= 42·64

[2]

(c) Each block shown in this tower is to have a number displayed on it.
For each pair of blocks that are next to each other in the same row, the number on the block above them is the total of the numbers on the two blocks.
Some numbers are already displayed.
What number should be written on the box marked *X*?



X = 8

[3]

Examiner only

9. *(a)* Describe **in words** the rule for continuing the following sequences.

(i) 5 9 13 17 21 .....

Rule: Add four to each term to get the next term

[1]

(ii) 243 81 27 9 3 .....

Rule: divide each term by three to get the next term

[1]

(b) (i) A toy costs t pence. Write down, in terms of t, the cost of the toy in £.

$tp = £\frac{t}{100}$ or £0·01t

[1]

(ii) On June 9th 2012, Beryl was m years old. Write down, in terms of m, her age on June 9th 2002.

$m - 10$

[1]

(c) Solve $3x - 7 = 11$.

$3x = 11 + 7$

$3x = 18$

$x = \frac{18}{3}$

$x = 6$

[2]

(d) There is a connection between the x and y coordinates in the following sequence of points.

(1, 4), (2, 5), (3, 6), (4, 7), ...

(i) Using the same connection, complete the following: (5, 8)

[1]

(ii) Using the same connection, complete the following: (x, $x+3$), giving your answer in terms of x.

[1]

Examiner only

10. The amount of money (in £) saved by Alan for each of 8 months was as follows:

43 30 75 54 62 46 24 82

(a) Find the range of the amounts saved.

82 − 24

= £58

[1]

(b) Find the mean of the amounts saved.

$\frac{43+30+75+54+62+46+24+82}{8}$

$= \frac{416}{8}$

= £52

[3]

(c) If Alan had saved £15 less every month, what would be

(i) the mean of the amounts saved,

£15 less than before ie mean = £37

[1]

(ii) the range of the amounts saved.

Same as before Max £15 less

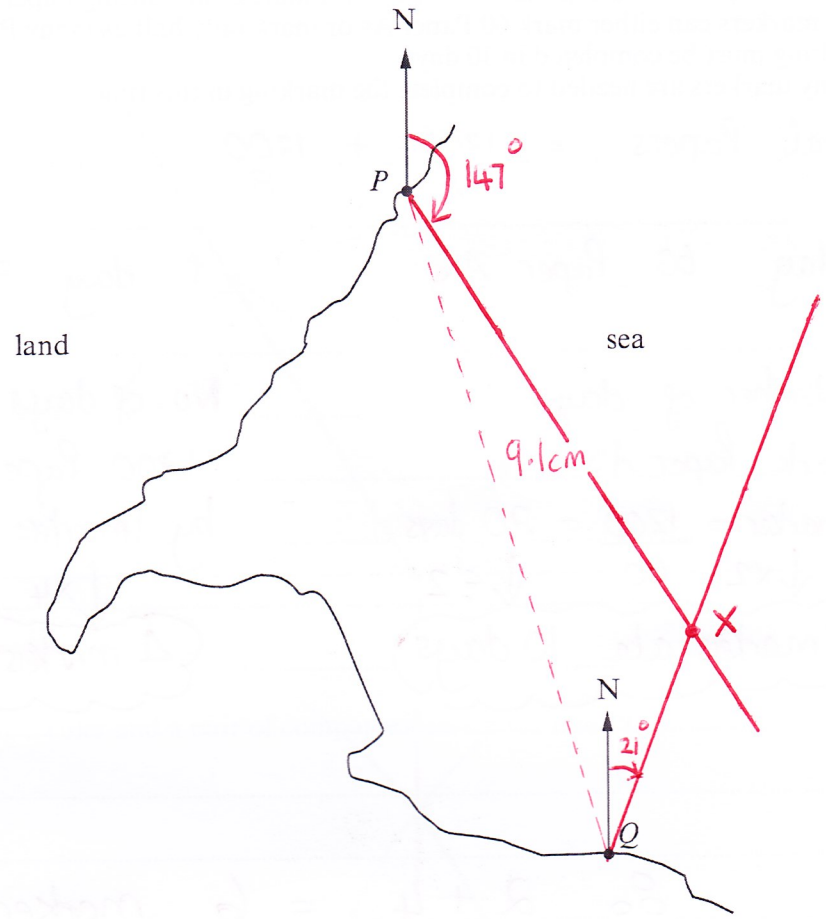
Min £15 less

Range = £58

[1]

Examiner only

11. *(a)* *P* and *Q* are two ports shown on a map with scale 1 cm = 8 km.
Find the straight-line distance, in km, from *P* to *Q*.



from P to Q = 9.1cm = 9.1 x 8
= 72.8 km

[3]

(b) A ship is on a bearing of 147° from *P* and on a bearing of 021° from *Q*.
Plot the position of the ship and mark it *X*.

[3]

Examiner only

12. *You will be assessed on the quality of your written communication in this question.*

In an examination, candidates sit 2 written papers called Paper A and Paper B.
In a forthcoming examination there are 1200 candidates, each sitting Paper A and Paper B.
In 1 day, markers can either mark 60 Paper As or mark only half as many Paper Bs.
The marking must be completed in 10 days.
How many markers are needed to complete the marking in this time?

Total Papers = 1200 (A) + 1200 (B)

1 day 60 Paper A's

So Number of days to mark Paper A's by 1 marker = 1200 / 60 = 20 days

↓ ×2 ↓ ÷2

2 markers take 10 days

1 day 30 Paper B's

No. of days to mark 1200 Paper B's by 1 marker = 1200 / 30 = 40 days

↓ ×4 ↓ ÷4

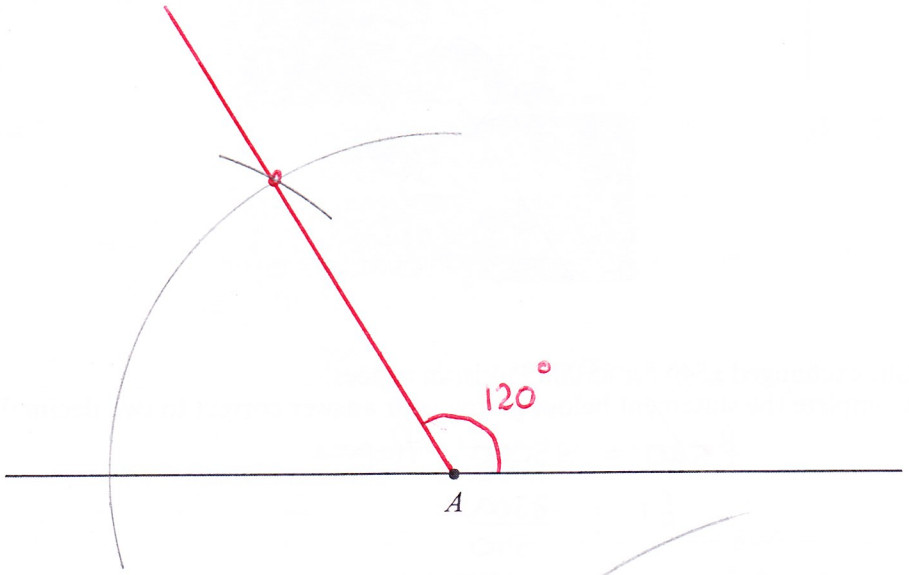
4 markers = 10 days

∴ 2 + 4 = 6 markers required to complete in 10 days.

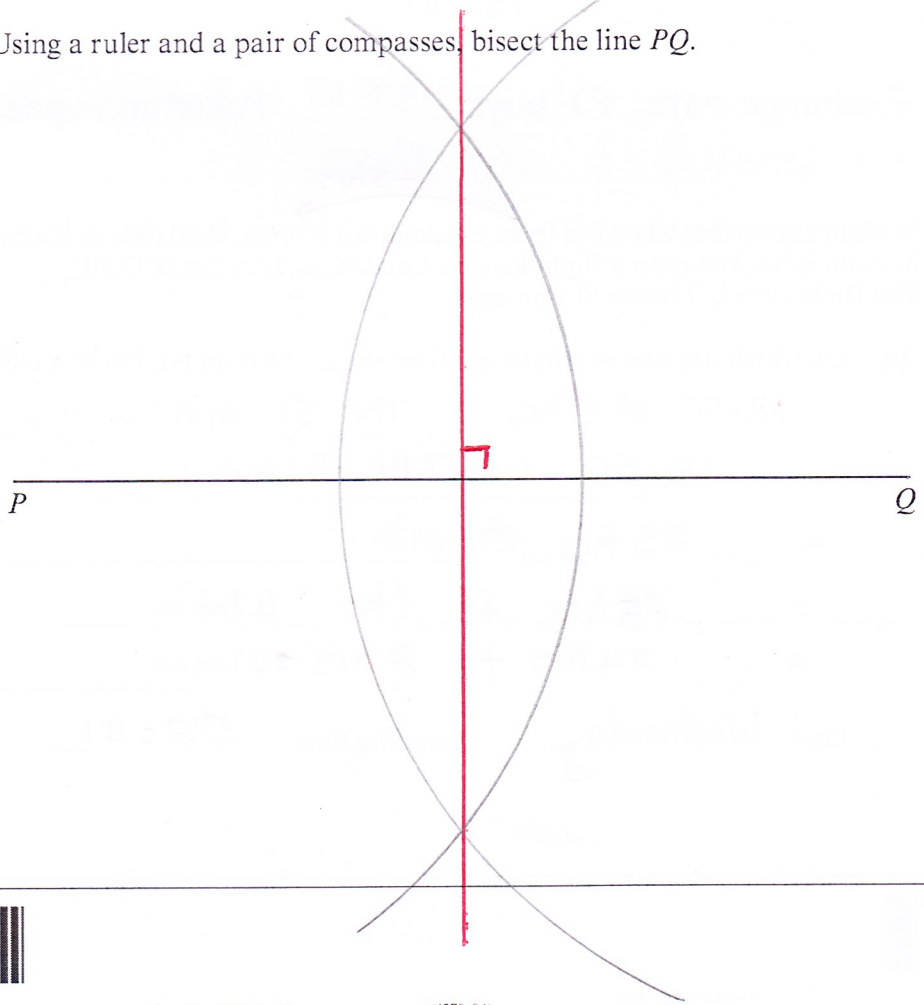
[8]

Examiner only

13. *(a)* Using a ruler and a pair of compasses, construct an angle of 120° at the point A on the line below. [2]



(b) Using a ruler and a pair of compasses, bisect the line PQ. [2]



Examiner only

14. Miriam is planning a holiday in Pakistan.

(a) Miriam went to an exchange bureau to get some Pakistan rupees for her holiday.

She exchanged £540 for 85 000 Pakistan rupees.
Complete the statement below, giving your answer correct to two decimal places.

£540 = 85000 Rupees

£1 = $\frac{85000}{540}$

= 157.41

'Exchange rate: £1 buys 157.41 **Pakistan rupees'** [3]

(b) Miriam knows that when it is 1p.m. in London it is 6p.m. local time in Karachi, Pakistan. (+5hrs)
Miriam is booked onto a flight leaving London on Tuesday at 13:50.
The flight time is 7 hours 51 minutes.

(i) On which day and at what local time should Miriam land in Karachi?

13.50 + 5hrs + 7hr 51 min

= 18.50 + 7hr 51 min

= 25 hrs 101 min

= 25 hrs + 1hr 41min

= 24 hrs + 2hrs 41min

Day Wednesday Landing time 02:41 [4]

Examiner only

(ii) Miriam's flight actually arrived 7 hours 45 minutes after departure.
The aeroplane flying speed between London and Karachi was 434 knots.
Given that 1 knot is 1·85 km/h, calculate the flying distance between London and Karachi.
Give your answer in kilometres.

45 min = $\frac{45}{60}$ hr = 0·75 hours

$\frac{3}{4}$ of an hour

Time taken = 7 hr 45 min
= 7·75 hrs

Speed = 434 knots
= 434 × 1·85
= 802·9 km/h

$S = \frac{D}{T}$ × T

S × T = D

802·9 × 7·75 = D

6,222·5 km = Distance required

[5]

Examiner only

15. Across the world, temperatures are measured using different units.
All the unit scales are uniform.

Approximate conversions are often used to give a reading in more than one unit in scientific reports.

Use the information given below to complete the tables.

(a)

degrees Celsius	degrees Fahrenheit
20	68
30	86
40	104
50	122
60	140
70	158

+10, +10, +10 (Celsius); +18, +18, +18 (Fahrenheit)

.....

.....

[1]

(b)

kelvin	degrees Celsius
0	−273·15
100	−173·15
200	−73·15
300	26·85
400	126·85
500	226·85

+100, +100, +100 (kelvin); + 100, + 100, +100 (Celsius)

Both k and °C behave in same way +100 each time

[2]

Examiner only

(c)

kelvin	degrees Celsius	degrees Fahrenheit
340	66·85 °C	152·33 °F

Kelvin and °C

300 + 40 = 340 k

26·85 + 40 = 66·85 °C

°C and °F

10 °C ≡ 18 °F rise

1 °C ≡ 1·8 °F

6·85 °C ≡ 6·85 × 1·8 ≡ 12·33 °

∴ 60 °C = 140 °F

66·85 °C = 140 + 12·33 °

= 152·33 °F

[5]

Examiner only

16. The diagram shows a rectangle $ABCD$.

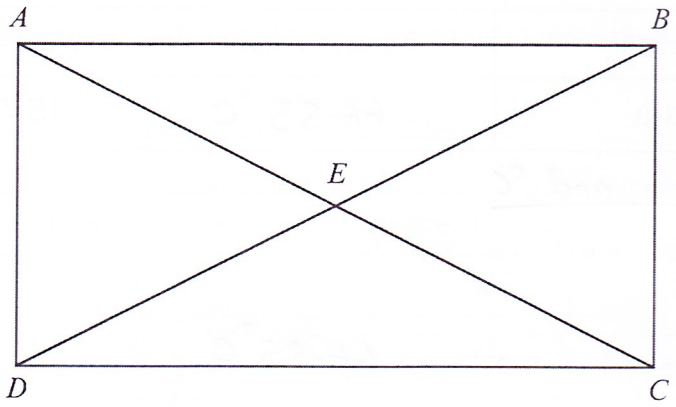


Diagram not drawn to scale

Select 3 **different** pairs of congruent triangles shown in the diagram above and then complete the sentences below for your 3 selections.

Triangle ABE is congruent to triangle CDE

Triangle AED is congruent to triangle BCE

Triangle ABD is congruent to triangle ABC

[3]

There are other options

eg. ACD is congruent to BCD

etc.

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17. A factory production line packs buttons into bags.
There are exactly 80 buttons packed into each bag.
There is a mixture of different coloured buttons in each bag.
A total of 600 bags of buttons were packed in a day.

The first 100 bags were checked and it was found that a total of 1200 red buttons had been used.
In the 600 bags of buttons it was found that the relative frequency of red buttons packed was 40%.

Calculate the relative frequency of red buttons packed in the final 500 bags.

1 bag 80 buttons.

600 bags = 600 x 80 = 48 000 buttons

First 100 bags

Total number of buttons = 100 x 80 = 8000

Total Red = 1200

ALL 600 bags

Rel freq red = 40%

∴ Number red = 40% of 48000

= 19 200

Last 500 bags

Number red = 19 200 − 1200

= 18 000

Total buttons = 500 x 80 = 40 000

[7]

∴ Rel. freq. Red final 500 bags

$= \frac{18000}{40000} \times 100\%$

= 45%.

Question number	Additional page, if required. Write the question numbers in the left-hand margin.

Examiner only