Surname	Centre Number	Candidate Number
Other Names		0

WJEC CBAC

GCSE

4370/04

SOLUTIONS

MATHEMATICS – LINEAR
PAPER 2
FOUNDATION TIER

A.M. TUESDAY, 17 June 2014

1 hour 45 minutes

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 **3***(b)*.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	6	
2.	4	
3.	7	
4.	5	
5.	4	
6.	5	
7.	5	
8.	8	
9.	7	
10.	6	
11.	6	
12.	4	
13.	5	
14.	5	
15.	4	
16.	6	
17.	13	
Total	100	

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1. *(a)* Ahmed buys some groceries.
Complete the **four** entries in the following table to show his bill for these items. [4]

Amount	Item	Cost (£)
6 packs	Butter @ £1.24 per pack	7·44
4 kg	Sugar @ 86p per kg	3·44
3 packs	Currants @ £1.54 per pack	4.62
Total		15·50

(b) He gets a 20% discount.
How much is this discount? [2]

15·50 ÷ 100 x 20 = £3·10

2. Circle the quantity that is the appropriate estimate for each of the following. [4]

Height of a man	170 km	170 m	170 mm	170 cm
Weight of a large dog	28 kg	28 g	28 mg	280 g
Capacity of a car's fuel tank	60 cm^3	600 ml	60 litres	6000 litres
Floor area of a room	18 m^2	18 cm^2	18 mm^2	18 cm^3

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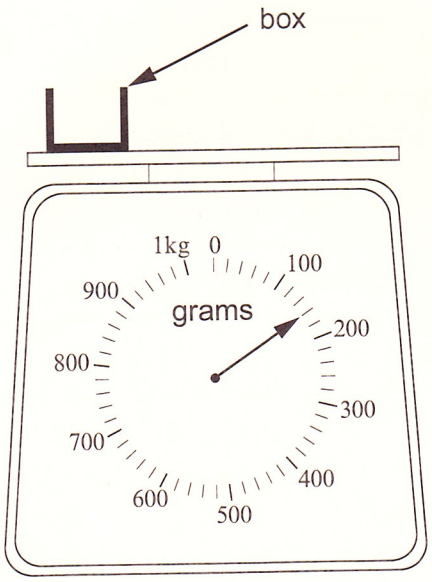
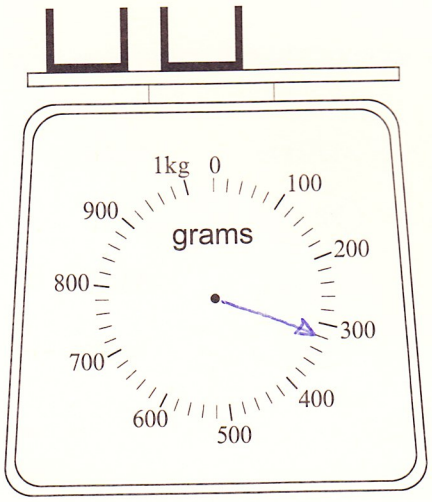
3. A box is placed on a scale.



(a) Two of these boxes are now placed on the scale.
Draw the pointer on the scale to show how much they weigh. [2]

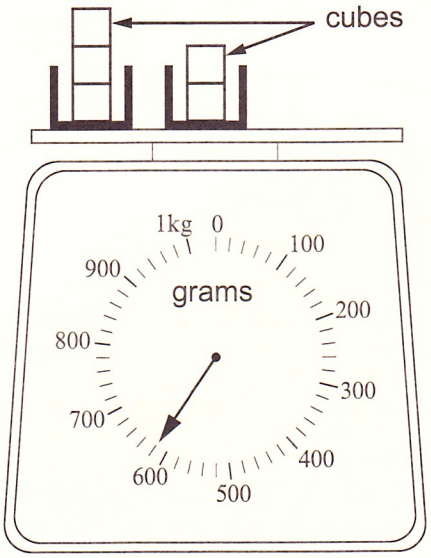


2 x 160 = 320 g

Examiner only

(b) *You will be assessed on the quality of your written communication in this part of the question.*

Five identical cubes are now placed as shown.
Find how much one cube weighs. [5]



2 boxes + 5 cubes = 620

320 + 5c = 620

5c = 620 - 320

from (a)

5c = 300

$c = \frac{300}{5}$

Single cube c = 60 g.

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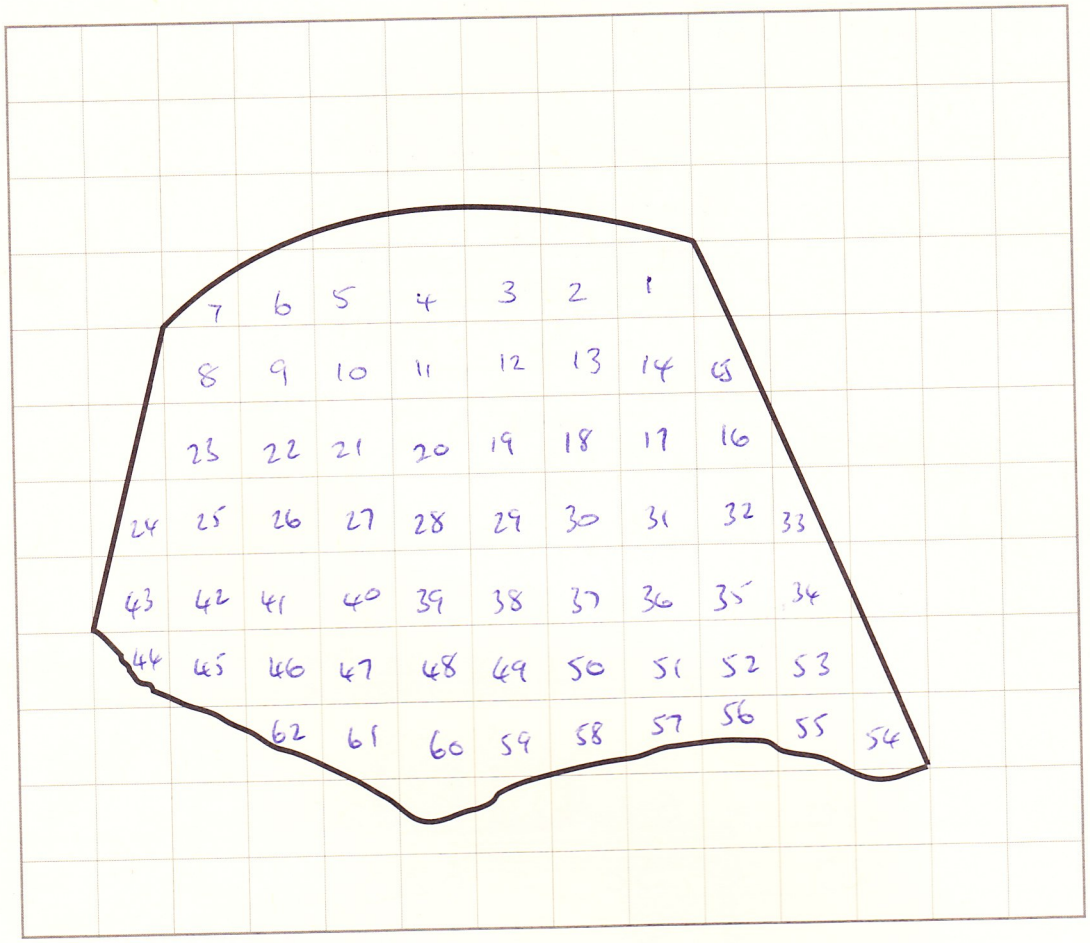
4. *(a)*



The above shape is the outline of a flowerbed in a park.
It is drawn on a square grid where each square represents an area of 8 m^2.
Estimate the area of the flowerbed. [3]

62 × 8

Any value 60 squares to 64 squares is allowed!

Area of the flowerbed = 496 m^2

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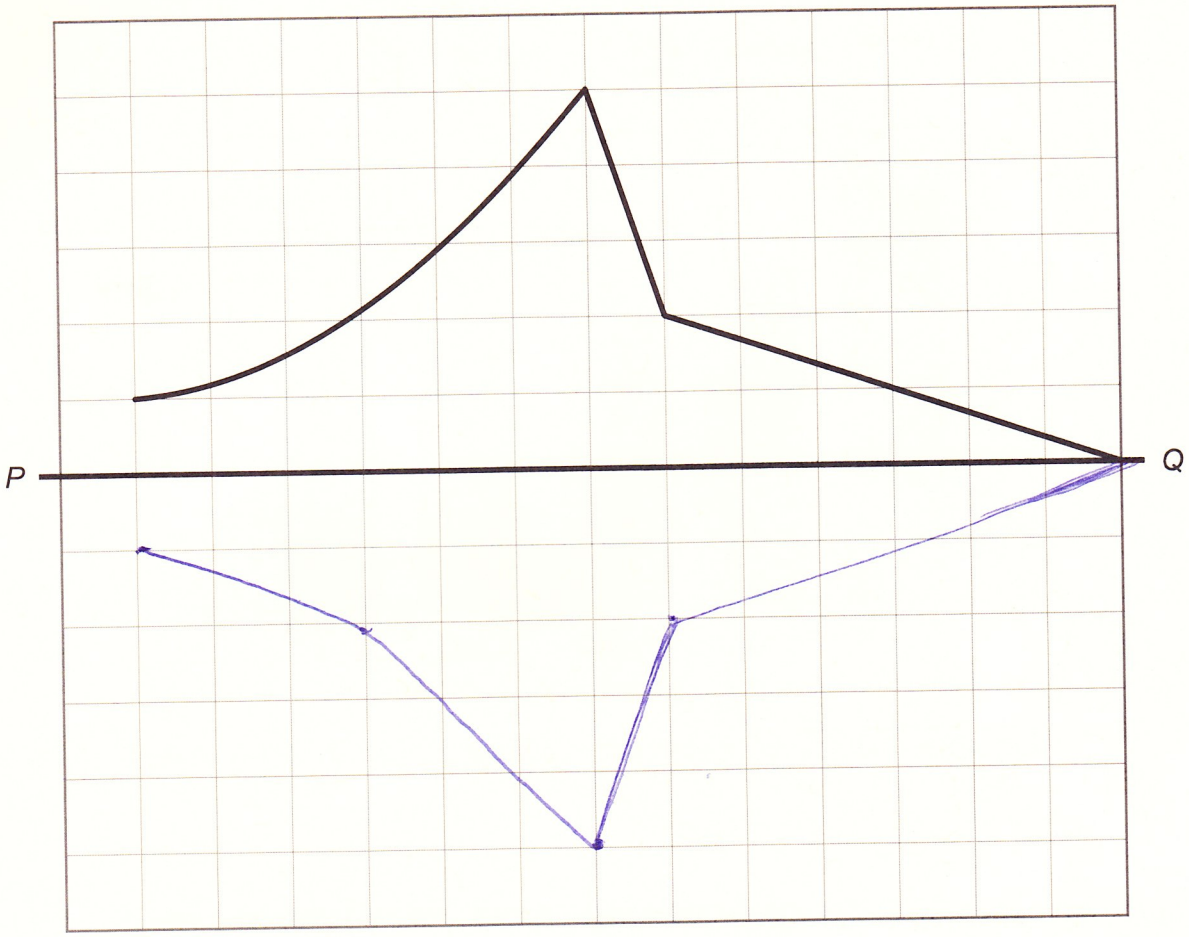
(b) Complete the following figure so that it is symmetrical about the line *PQ*. .[2]



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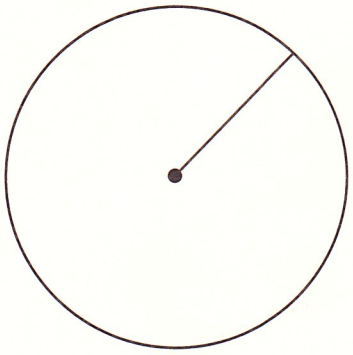
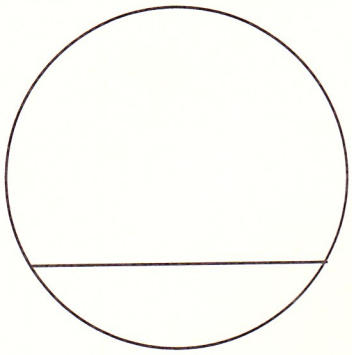
5. *(a)* Write down the special name of the straight line shown in each of the following diagrams. [2]



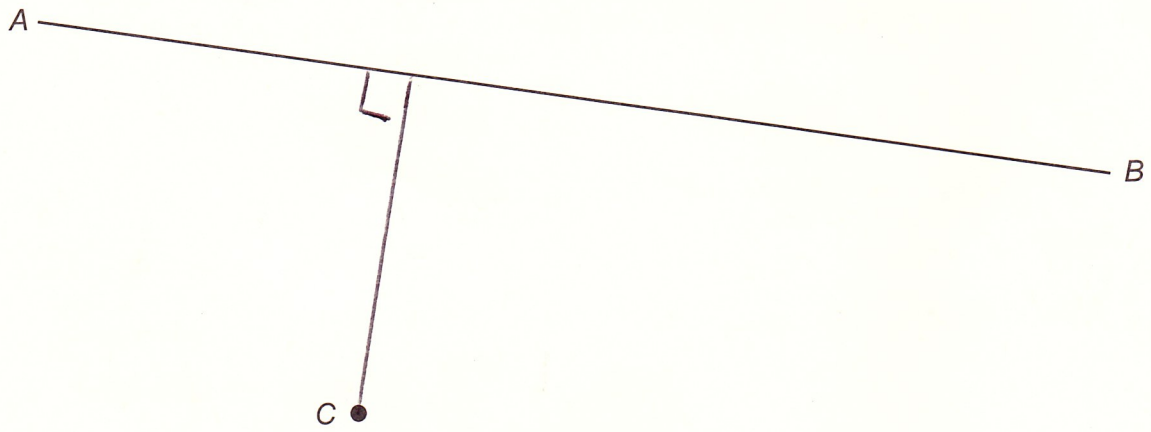
Radius



chord

(b) (i) Measure, in millimetres, the length of the line *AB*. [1]

Length of *AB* = 143 mm



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

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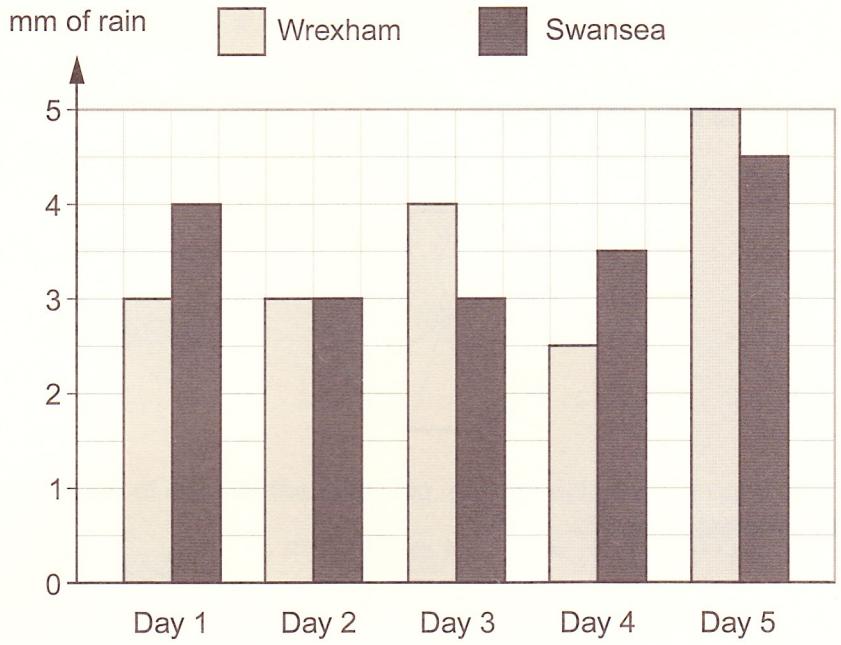
6. The chart shows the number of millimetres of rainfall recorded in Wrexham and Swansea on five different days.



(a) On which day did Wrexham and Swansea have the same amount of rainfall? [1]

Day 2

(b) On how many days did Wrexham have less than 4 mm of rainfall? [1]

Days 1, 2, 4

(c) On how many days was there more rain in Swansea than in Wrexham? [1]

2 days (Day 1 and Day 4)

(d) Find the total number of mm of rain that fell on Wrexham over these 5 days. [1]

3 + 3 + 4 + 2·5 + 5 = 17·5 mm

(e) What was the median number of mm of rain in Swansea over the 5 days? [1]

4, 3, 3, 3·5, 4·5

In order 3, 3, [3·5], 4, 4·5

Median = 3·5 mm

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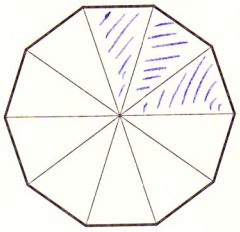
same as $\frac{40}{100}$

Examin only

7. *(a)* Draw a circle around all of the following fractions that are equal to 40%. [2]

$\frac{8}{20}$ $\frac{1}{4}$ $\frac{2}{5}$ $\frac{10}{40}$ $\frac{5}{20}$

(b) Shade 30% of the following figure. [1]



30% is the same as $\frac{3}{10}$

(c) Find, in its simplest form, $\frac{5}{6} - \frac{1}{3}$. [2]

$= \frac{5}{6} - \frac{2}{6}$

$= \frac{3}{6}$

$= \frac{1}{2}$

Examiner only

8. *(a)* Find the value of

(i) $3 - (-4) + (-6)$, [1]

$3 + 4 - 6 = 1$

(ii) $20 - 3(-2) + 5(-6)$. [1]

$20 + 6 - 30 = -4$

(b) Calculate 87% of 58. [2]

$58 \div 100 \times 87$

$=$

(c) Find the value of each of the following, giving each answer correct to one decimal place.

(i) $\dfrac{75{\cdot}61}{42{\cdot}3 + 6{\cdot}34}$ [2]

$= \dfrac{75{\cdot}61}{48{\cdot}64} = 1{\cdot}554481908$

Answer $\approx 1{\cdot}6$

(ii) $3{\cdot}4^2 + \sqrt{6{\cdot}457}$ [2]

$= 11{\cdot}56 + 2{\cdot}54106277$

$= 14{\cdot}10106277$

$\approx 14{\cdot}1$

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Examiner only

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

(i) 2 9 16 23 30 ..... [1]

Rule:

Add seven to get the next term

(ii) 4 –12 36 –108 324 ..... [1]

Rule:

Multiply by (-3) to get next term

(b) (i) A ticket costs t pounds (£). Write down, in terms of t, the cost of the ticket in pence. [1]

100t p

(ii) Joan is h cm tall. Gill is 3 cm shorter than Joan.
Write down Gill's height in terms of h. [1]

h - 3

(iii) A block weighs w kg.
Write down, in terms of w, the weight of 8 such blocks. [1]

8w

(c) Solve

(i) $3x = 15$, [1]

$x = \frac{15}{3}$

$x = 5$

(ii) $x + 5 = 16$. [1]

$x = 16 - 5$

$x = 11$

Examiner only

10. The ages (in years) of the 8 members of an evening class are as follows:

36 28 45 24 31 34 27 47

smallest

biggest

(a) (i) Find the range of the ages of the members of the class. [1]

47 − 24 = 23 years

(ii) What was the range of their ages one year ago?
Give a reason for your answer. [2]

23 years because it would have been 46−23

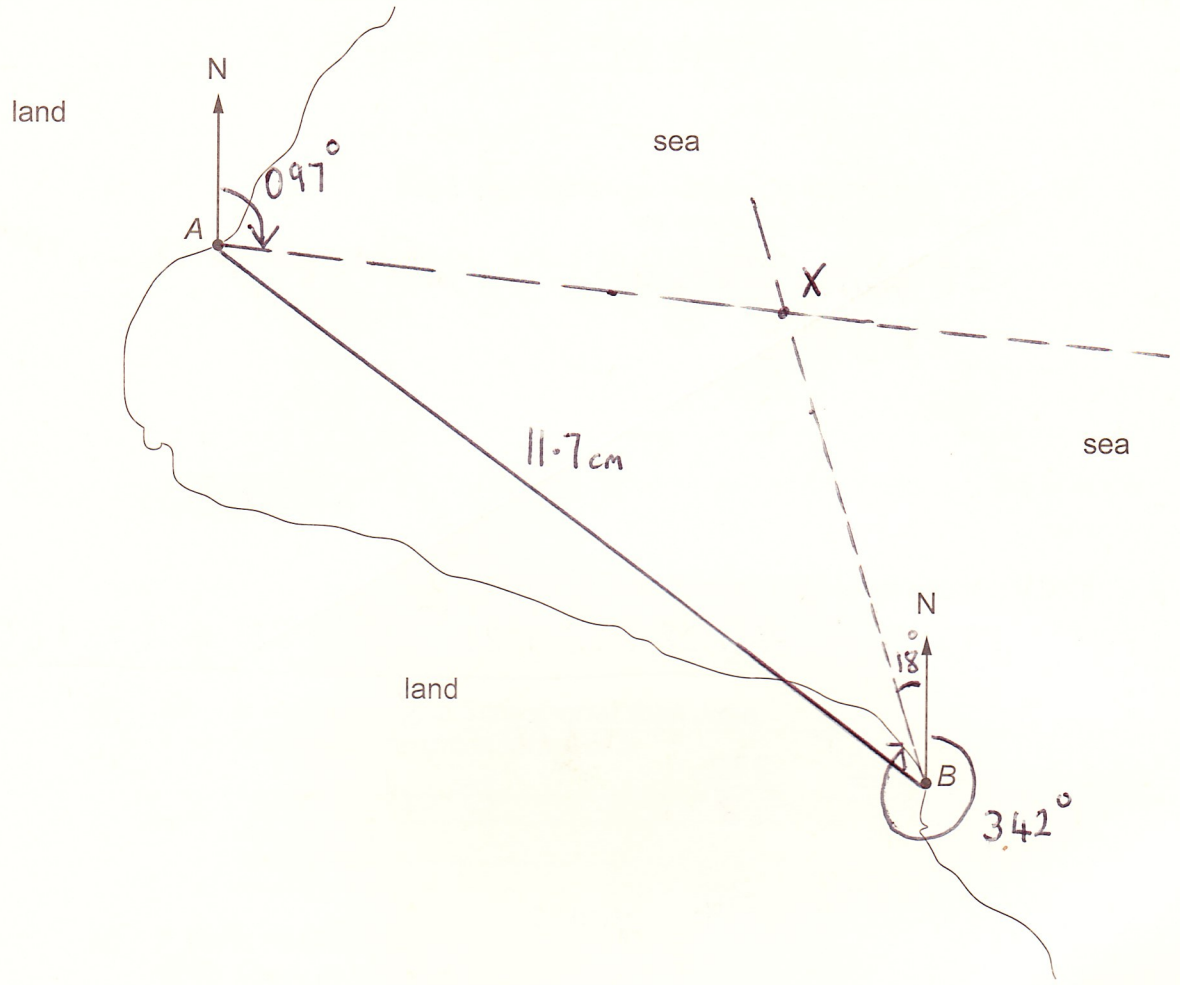
(b) Find the mean age of the members of the class. [3]

$$\text{Mean} = \frac{36+28+45+24+31+34+27+47}{8}$$

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

$$= 34 \text{ years}$$

11. *(a)* *A* and *B* are two ports shown on a map with scale 1 cm = 10 km.
Measure and find the straight line distance, in km, from *A* to *B*. [3]



11·7 cm = 11·7 × 10 = 117 Km

(b) A ship is on a bearing of 097° from *A* and on a bearing of 342° from *B*.
Plot the position of the ship and mark it *X*. [3]

Examiner only

12. *(a)* Geoff changed £1200 into US dollars ($), when the rate of exchange was £1 = $1.52.
How many dollars did he get? [2]

1200 × 1·52

= $1824

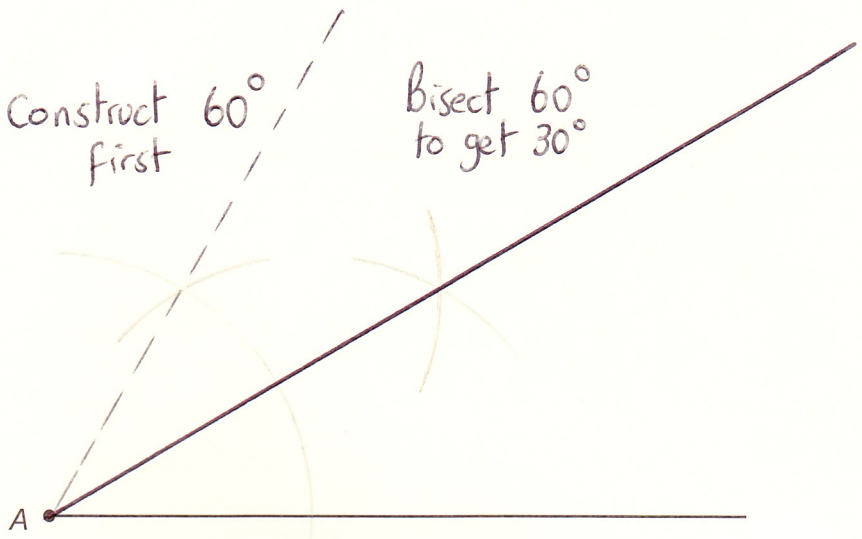
(b) During his stay, Geoff spent $1649 altogether. On his return, he changed his remaining dollars back into pounds, at the same exchange rate.
How much did he receive in pounds? [2]

1824 − 1649 = $175 left

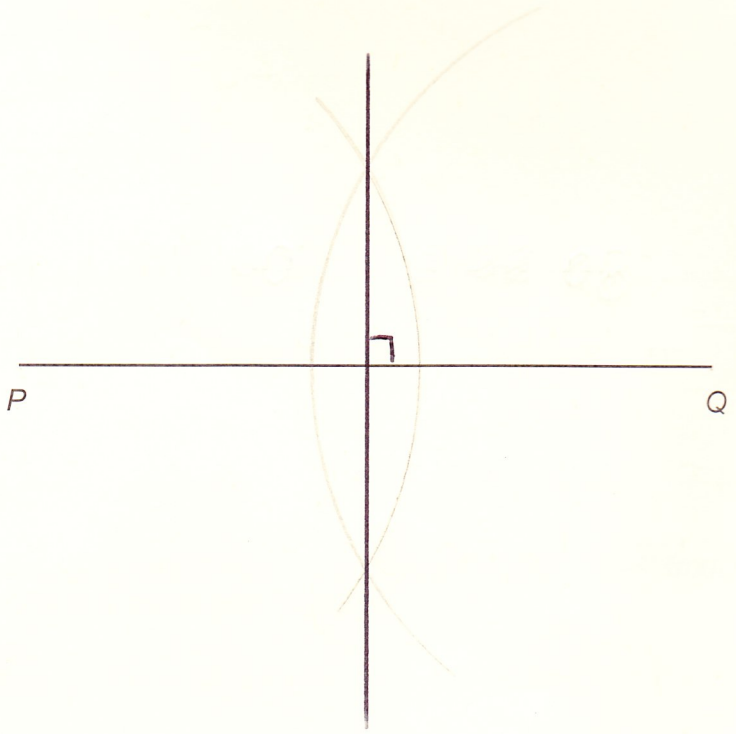
∴ → $\frac{175}{1.52}$ = £115·13

Examiner only

13. *(a)* Using a ruler and a pair of compasses, construct an angle of 30° at the point *A* on the line below. [3]

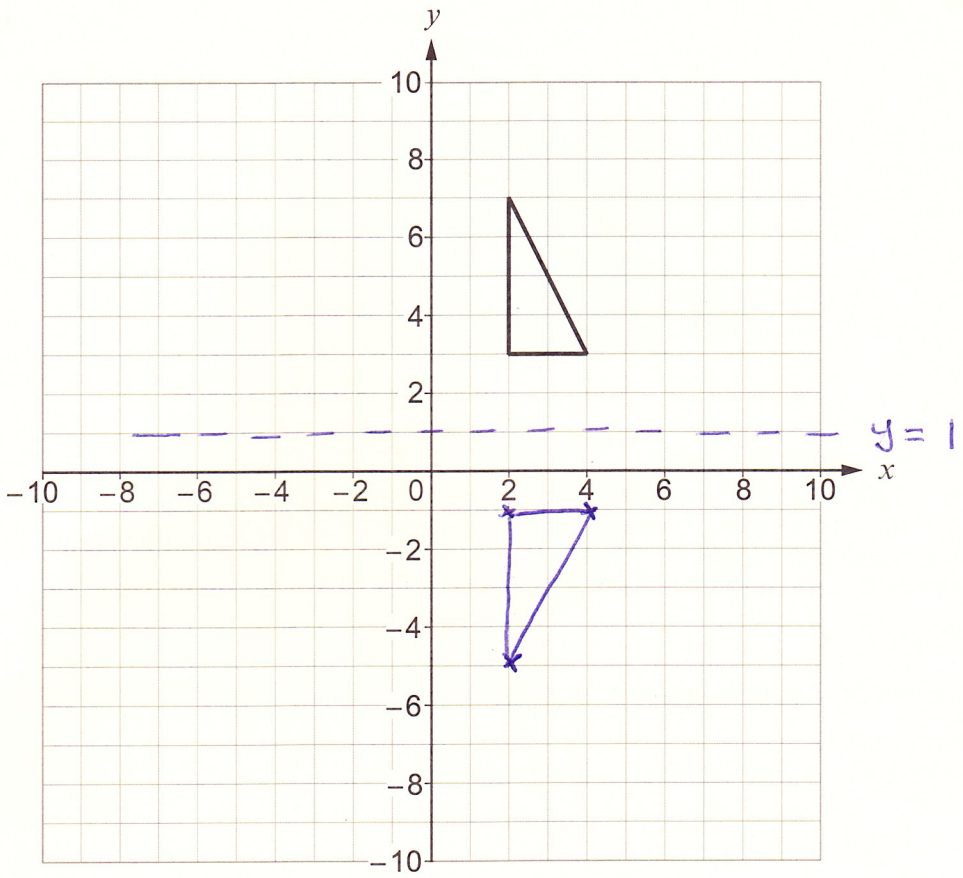


(b) Using a ruler and a pair of compasses, draw the perpendicular bisector of the line *PQ*. [2]

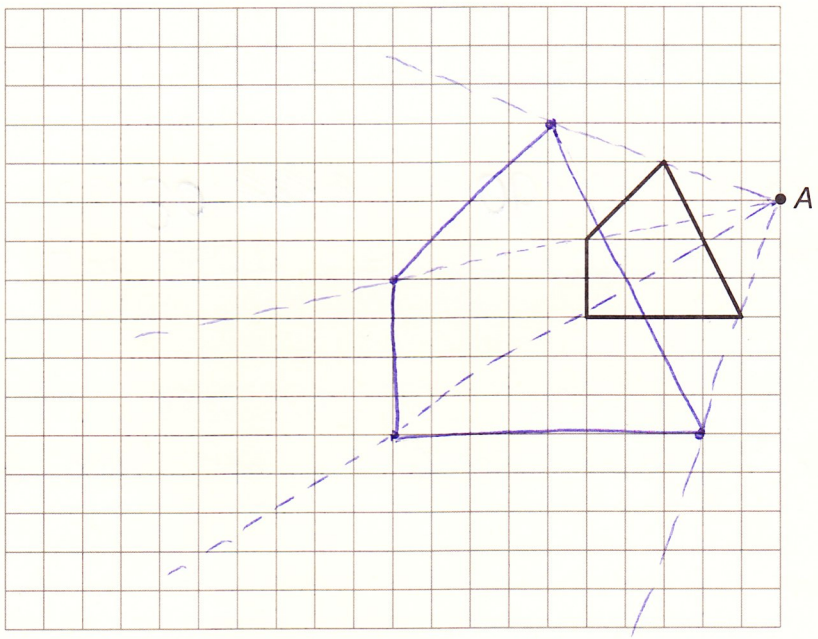


Examine only

14. *(a)* Draw a reflection of the triangle in the line $y = 1$. [2]



(b) Enlarge the shape shown on the grid by a scale factor of 2, using *A* as the centre of the enlargement. [3]



15. The ruling body for international football has rules for the dimensions of rectangular football pitches.

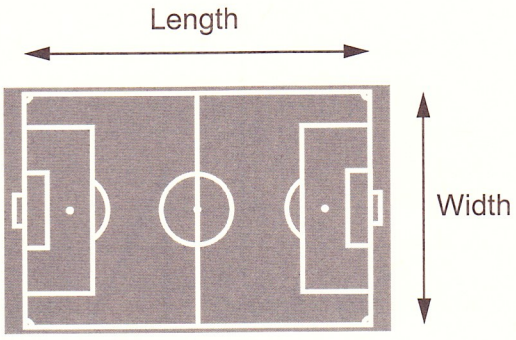


Diagram not drawn to scale

Football pitch dimension rules:

- the minimum width is 45 m
- the maximum width allowed is double the minimum width
- the maximum length is 120 m
- the minimum length allowed is three-quarters of the maximum length

Susan says

'The maximum area of a pitch is **at least 50%** greater than the minimum area of a pitch.'

Is Susan correct?
You must show all your working to justify your answer. [4]

MAX Length = 120m

Min length = $\frac{3}{4}$ of 120 = 120 ÷ 4 x 3 = 90m

Min width = 45m

Max width = 2 x 45 = 90m

MAX area = 120 x 90 = 10800 m^2

Min area = 90 x 45 = 4050 m^2

Susan is correct as min area needs to increase by over 100% to get max area.

Examin only

16. Claudia was given the following information.

UK Income Tax

April 2013 to April 2014

taxable income = gross income – personal allowance

- personal allowance is £9205
- basic rate of tax: 20% on the first £32 255 of taxable income
- higher rate tax: 40% is payable on all taxable income over £32 255

During the tax year 2013 to 2014, Claudia's gross income was £52 250.

Calculate the total amount of tax that Claudia should pay.
You must show all your working. [6]

Taxable income = 52 250 − 9205
= £43 045

Tax to pay 20% of 32 255 = $\frac{32\,255}{10}$ × 2 = £6451

Also 40% of (43 045 − 32 255)
= 40% of £10 790
= $\frac{10\,790}{10}$ × 4 = £4316

Total tax to pay = 6451 + 4316
= £10,767

17. *(a)* In 2013, there were 119 days on which there was rain or snowfall in Moscow.
For what fraction of the number of days in 2013 was there **no** rain and **no** snowfall in Moscow? [1]

$365 - 119 = 246$ ∴ $\frac{246}{365}$

(b) The mean temperature in Moscow for a 12 month period is 4°C.
It is warmest in July, typically 26°C.
What would be the estimate for the mean temperature in Moscow if the temperature for July was not included? [4]

TOTAL of monthly temperatures for year $= 12 \times 4 = 48°C$

∴ $48 - 26 = 22°C$

↑ July average

∴ without July $\frac{22}{11} = 2°C$ mean average

(c) One year, during the 31 days in March, the temperature was recorded every day at midday.
The results are shown in the table below.

Midday temperature, t in °C	Number of days	Mid Point
$-12 \leqslant t < -10$	1	−11
$-10 \leqslant t < -8$	3	−9
$-8 \leqslant t < -6$	5	−7
$-6 \leqslant t < -4$	8	−5
$-4 \leqslant t < -2$	4	−3
$-2 \leqslant t < 0$	10	−1

Calculate an estimate for the mean midday March temperature in Moscow.
You must show all your working. [4]

Estimated Mean $= \frac{1\times(-11) + 3(-9) + 5(-7) + 8(-5) + 4(-3) + 10(-1)}{31}$

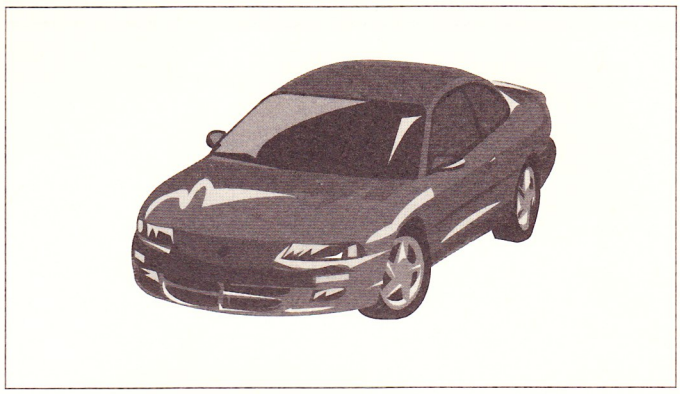
$= \frac{-11 - 27 - 35 - 40 - 12 - 10}{31}$

$= \frac{-135}{31}$

$= -4.4°C$

Examiner only

(d) Boris bought a car in Moscow for 251 850 Russian roubles.



Each year, the value of Boris's car depreciates by 10% of its value at the start of the year. At the end of two years, by how much has the value of Boris's car depreciated? [4]

Final value $= 251\,850 \times 0.90^2$

$= 203\,998.50$ Roubles

∴ Depreciation

$= 251\,850 - 203\,998.50$

$= 47\,851.50$ Roubles

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