LJH Worked Solutions

LJH mark scheme

Write your name here

Surname	Other names

Pearson Edexcel
Level 1 / Level 2
GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics

Paper 2 (Calculator)

YEAR 10 EXAM
JUNE 2017

Foundation Tier

Time: 1 hour 30 minutes

Paper Reference
1MA1/2F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks
80

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over

P 4 8 8 5 5 A 0 1 2 4

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Simplify $5p - 3p + p$

3p B1

(1)

(b) Simplify $m^3 + m^3$

$2m^3$ B1

(1)

(c) Simplify $10 + 3c + 5d - 7c + d$

10 + 6d − 4c

M1 any two correct terms

~~A1~~

10 + 6d − 4c

(2)

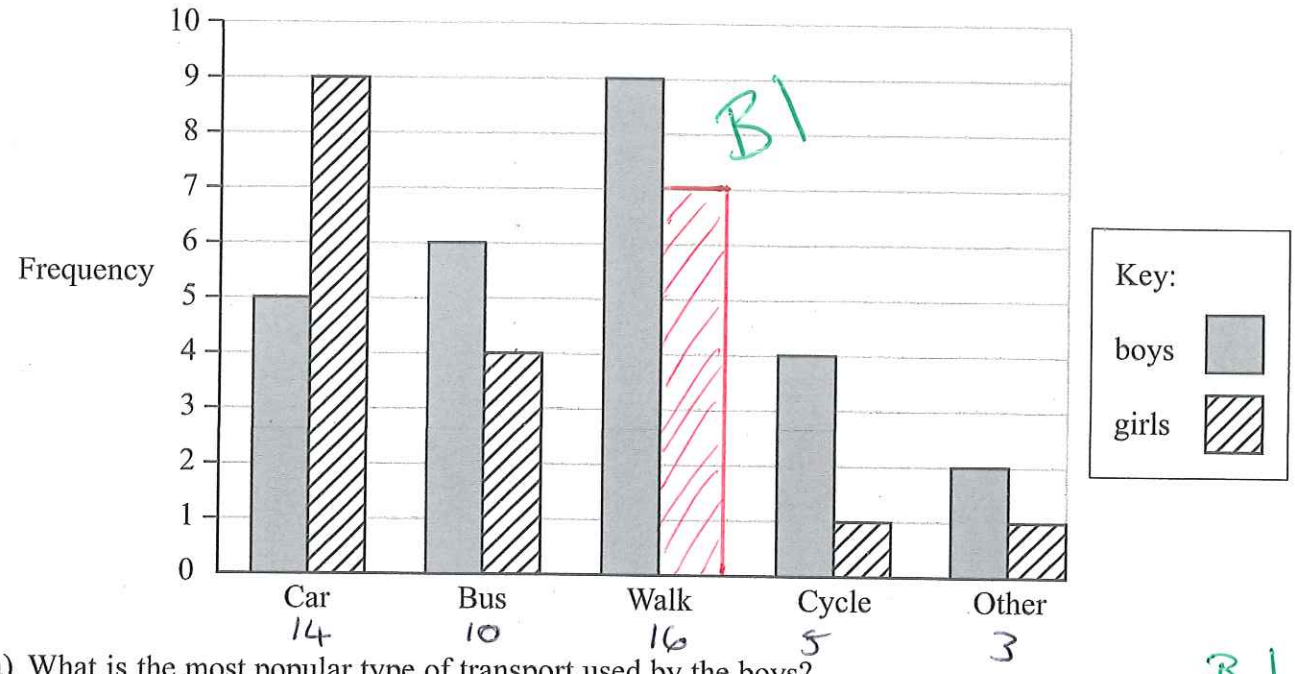
(Total for Question 1 is 4 marks)

2 Write 56.78 correct to one significant figure.

60 B1

(Total for Question 2 is 1 mark)

A teacher asks the students in Year 6 what type of transport they use to get to school.
The dual bar chart shows some of the results.



B1

(a) What is the most popular type of transport used by the boys?

B1

Walk

(1)

7 girls walk to school.

(b) Show this information on the dual bar chart.

(1)

More of the students get to school by car than by bus.

(c) How many more?

4 B1

(1)

The number of students in Year 5 is the same as the number of students in Year 6

(d) What is the total number of students in Years 5 and 6?

Total Year 6 = 48
∴ Total Year 5 = 48 +

M1 attempts to find totals and add together

96

(2)

A1 cao

(Total for Question 3 is 5 marks)

Turn over

4 Here are four fractions.

$\frac{2}{5}$ $\frac{11}{30}$ $\frac{1}{2}$ $\frac{7}{15}$

Write these fractions in order of size.
Start with the smallest fraction.

$\frac{12}{30}$ $\frac{11}{30}$ $\frac{15}{30}$ $\frac{14}{30}$

M1 attempts to find use common denominator

$\frac{11}{30}$ $\frac{12}{30}$ $\frac{14}{30}$ $\frac{15}{30}$

$\frac{11}{30}$ $\frac{2}{5}$ $\frac{7}{15}$ $\frac{1}{2}$ A1

.....

(Total for Question 4 is 2 marks)

5 David sells CDs in a shop.

The tally chart shows information about the number of CDs David sold on Monday, on Tuesday and on Wednesday.

	Tally	Frequency
Monday	𝍸 𝍸 | | |	12
Tuesday	𝍸 𝍸 𝍸 | | |	18
Wednesday	𝍸 | | |	8

(a) Write down **one** thing that is wrong with the tally chart.

Monday frequency is 13 not 12 B1

(1)

David drew this pictogram to show the information for Tuesday and Wednesday.

Tuesday	◐ ◐ ◐ ◐ ◐
Wednesday	◐ ◐ ◖

Key: ◐ represents 3 CDs

(b) Write down **one** thing that is wrong with this pictogram.

• Tuesday shows 15 CD's but should have one more ◐ to show 18 B1 any sensible

(1)

OR • ◐ = 3 ∴ ◖ = 1·5

(Total for Question 5 is 2 marks)

Wednesday shows 7.5 CD's but should show 8

6 There are 495 coins in a bottle.

$\frac{1}{3}$ of the coins are £1 coins.
124 of the coins are 50p coins.
The rest of the coins are 20p coins.

Work out the total value of the 495 coins.

£1 coins

$\frac{1}{3}$ of 495 = £165

$165 \times £1 = £165$

B1 either 165 or 62 seen

50p coins

$124 \times £0.50 = £62$

P1 uses a fully correct process to find the value of the 20p coins (this may use their 165 and 62)

20p coins

$165 + 124 = 289$

$495 - 289 = 206$

$\therefore 206 \times £0.20 = £41.20$

M1 ft adds their 3 amounts

Total value = £165 + £62 + £41.20

= £268.20 A1 cao

£ 268.20

(Total for Question 6 is 4 marks)

7 The probability that a new fridge has a fault is 0.015

What is the probability that a new fridge does **not** have a fault?

$1 - 0.015 = 0.985$

A1

0.985

(Total for Question 7 is 1 mark)

8 Here is a list of numbers.

21 22 23 24 25 26 27 28 29

(a) From the numbers in the list, write down a square number.

25 B1

(1)

(b) From the numbers in the list, write down a number that is a multiple of **both** 4 and 6

24 B1

(1)

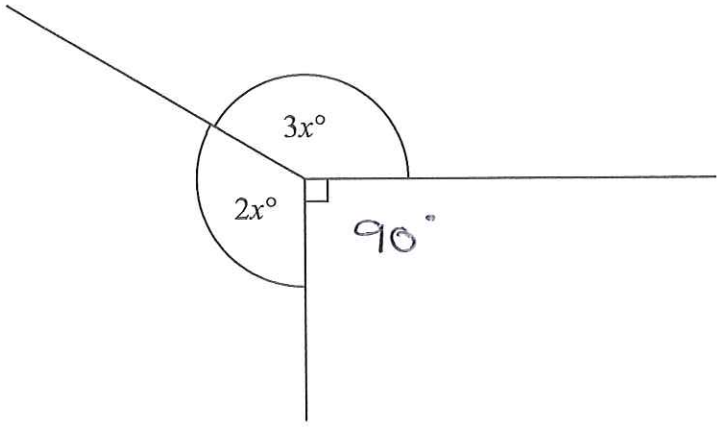
(c) Write down all the prime numbers in the list.

23, 29 B1 (both needed)

(1)

(Total for Question 8 is 3 marks)

9



Find the value of x.

M1 forms an equation

$90^\circ + 2x^\circ + 3x^\circ = 360^\circ$

M1 any correct ft algebraic step

$90 + 5x = 360$ [− 90

$5x = 270$ [÷ 5

$x = 54^\circ$

A1 cao

$x = 54^\circ$

(Total for Question 9 is 3 marks)

10 Suha is going to buy 150 envelopes.

Here is some information about the cost of envelopes in two shops.

Letters2send	**Stationery World**
Pack of 25 envelopes for £3.49	Pack of 10 envelopes for £2.10 Buy 2 packs get 1 pack free

B1 either 6 or 15 seen

Suha wants to buy the envelopes as cheaply as possible.

Which shop should Suha buy the 150 envelopes from?
You must show how you get your answer.

Letters 2 send

Packs needed = $\frac{150}{25} = 6$

$6 \times £3.49 = £20.94$

Stationery World

Packs needed = $\frac{150}{10} = 15$

Buy two packs get one

Pay for 10 packs, get 5 free

$10 \times £2.10$

$= £21.00$

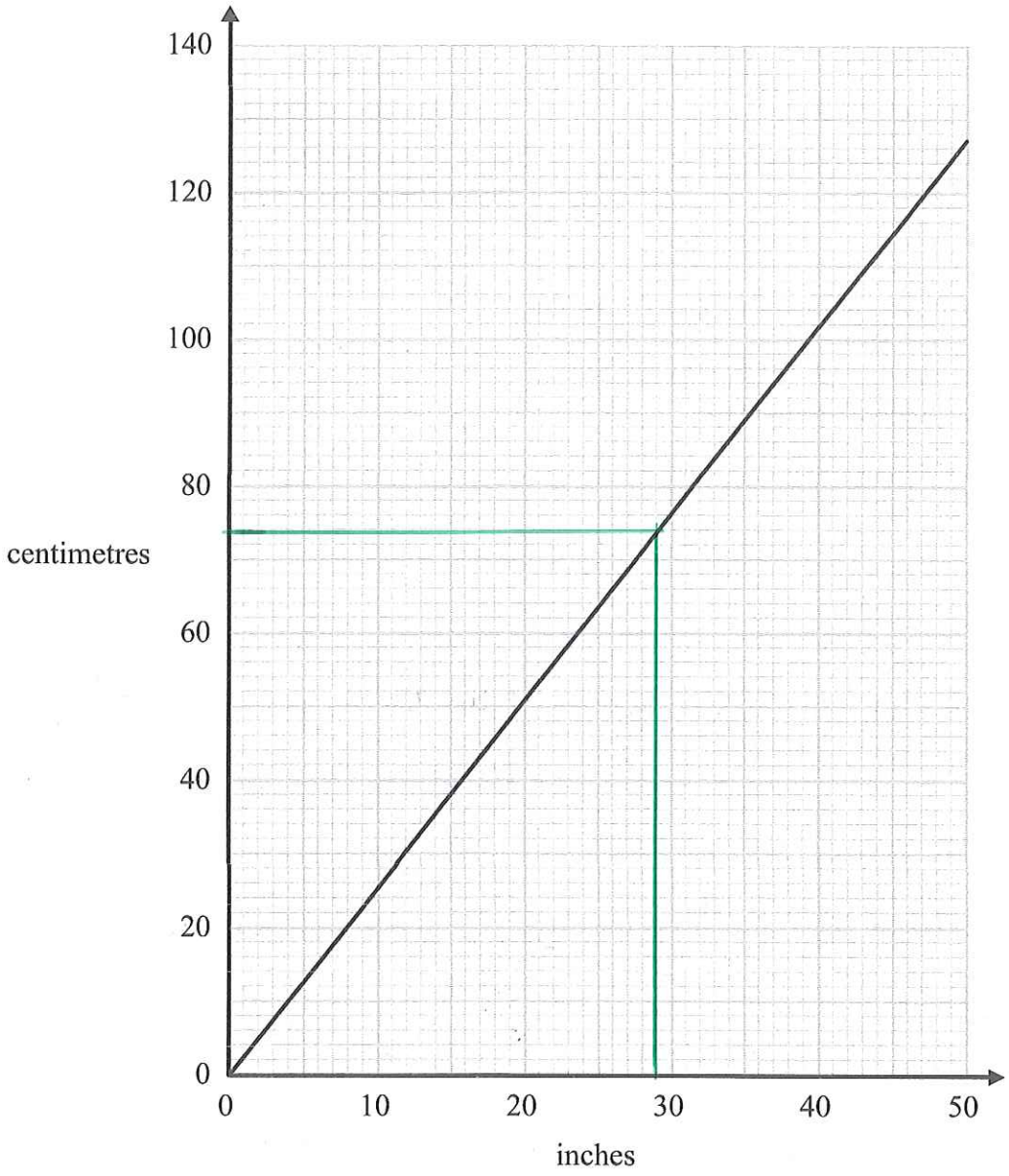
M1 correct method to apply the BOGOF deal

A1 both £20.94 or £21.00

Suha should buy her envelopes from Letters 2 Send as this will be 6p cheaper C1

(Total for Question 10 is 4 marks)

11 You can use this graph to change between inches and centimetres.



(a) Change 74 cm to inches.

B1

29 inches

(1)

Daniel's height is 6 feet 3 inches.

1 foot = 12 inches

(b) What is Daniel's height in centimetres?

feet $\xrightarrow{\times 12}$ inches

6 feet × 12 = 72 inches

∴ Daniels height is 72 + 3 = 75 inches

M1 correct conversion

Using graph

50 inches = 127 cm

25 inches = 63.5cm +

75 inches = 190.5cm

M1 sensible use of graph

A1 189 – 192

..... centimetres (3)

(Total for Question 11 is 4 marks)

12 Find the value of $\dfrac{\sqrt{13.4 - 1.5}}{(6.8 + 0.06)^2}$

Write down all the figures on your calculator display.

$= \dfrac{\sqrt{11.9}}{(6.86)^2}$

B1 either 11.9 or 6.86 seen

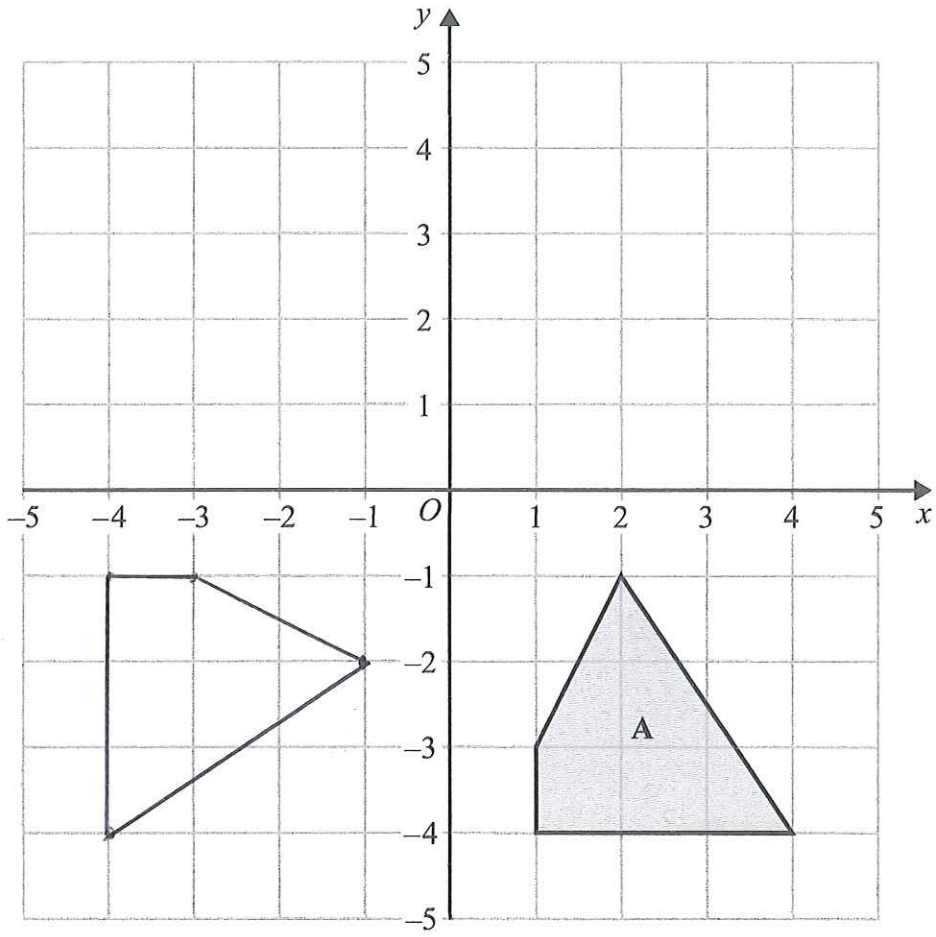
$= 0.0733035908$ A1 cao

this step not needed for full marks

answer only scores full marks

(Total for Question 12 is 2 marks)

13

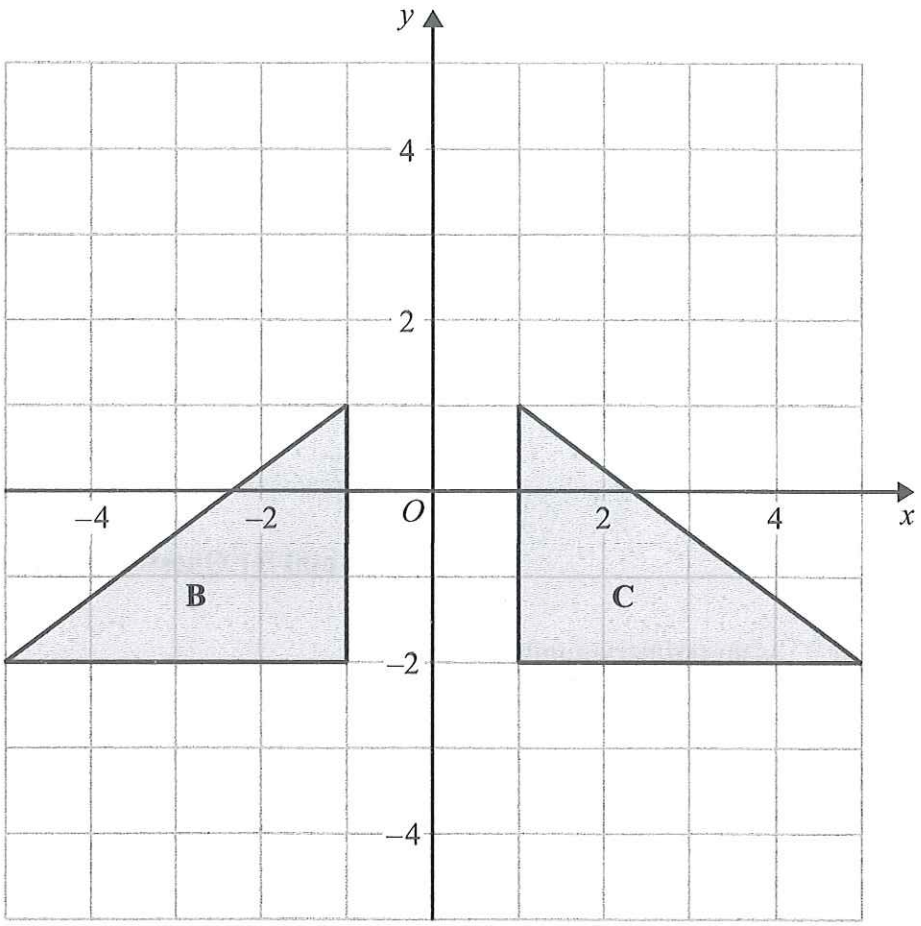


(a) Rotate shape A 90° clockwise about centre O.

(2)

B1 correct shape (in any position)

B1 fully correct



(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.

reflection in y-axis (x = 0 line)

B1 B1

(2)

note If more than one transformation named score B0 B0

(Total for Question 13 is 4 marks)

14 (a) Factorise $5 - 10m$

B1
$5(1-2m)$
(1)

(b) Factorise fully $2a^2b + 6ab^2$

$2aab + 2 \times 3abb$

m1 any correct fact.
A1 fully correct fact.

$2ab(a+3b)$
(2)

(Total for Question 14 is 3 marks)

15 (a) Write 4.7×10^{-1} as an ordinary number.

↑
÷10 once

B1
0.47
(1)

(b) Work out the value of $(2.4 \times 10^3) \times (9.5 \times 10^5)$
Give your answer in standard form.

$= 2280000000$ m1
$= 2.28 \times 10^9$

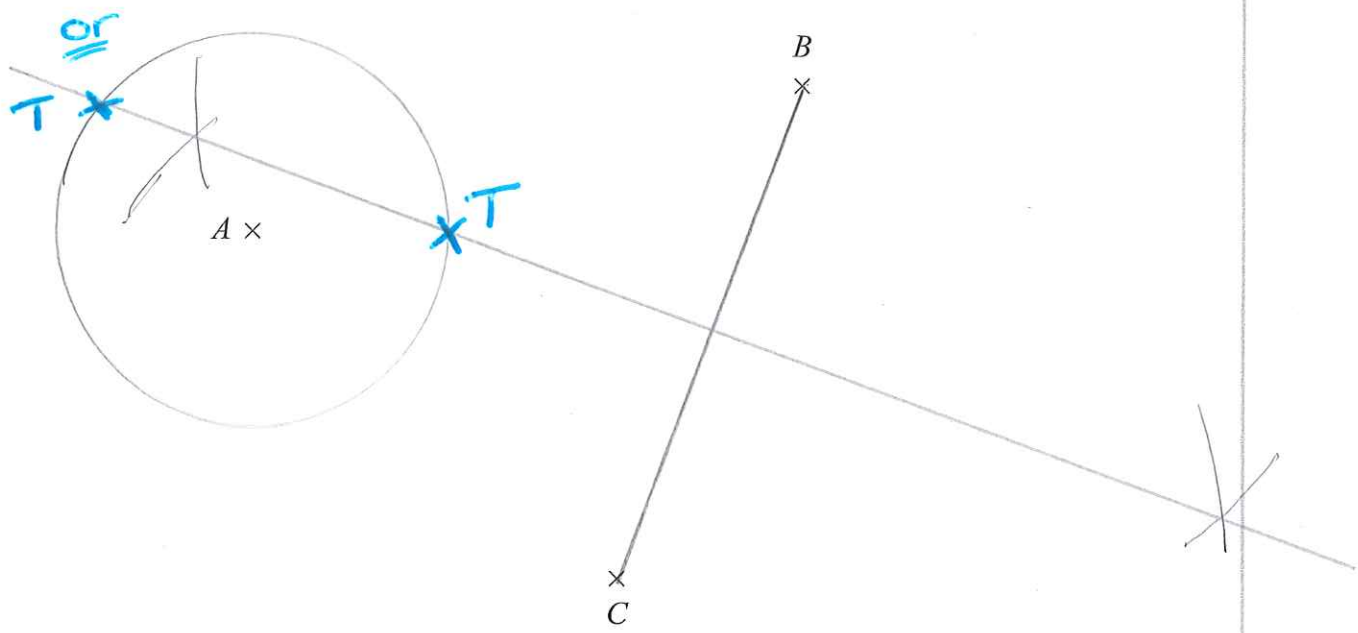
or
$2.4 \times 9.5 = 22.8$
$10^3 \times 10^5 = 10^8$
22.8×10^8
$= 2.28 \times 10^9$

A1
2.28×10^9
(2)

note
answer only
scores m1 A1

(Total for Question 15 is 3 marks)

16 A, B and C are three points on a map.



B1 use of 2·5cm as radius of circle

1 cm represents 100 metres.

Point T is 250 metres from point A. 250m = 2·5cm circle radius 2·5cm

Point T is equidistant from point B and point C. ~~circle~~ perp. bisector of BC

B1 correct perp. bisector of BC

On the map, show one of the possible positions for point T.

(Total for Question 16 is 3 marks)

A1 either position marked as T

17 The table shows the probabilities that a biased dice will land on 2, on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability	0.31	0.17	0.18	0.09	0.15	0.1

Neymar rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 1 or on 3

P(lands on 1) = 1 − (0.17 + 0.18 + 0.09 + 0.15 + 0.1)

P1 correct process to find Prob lands on 1 = 1 − 0.69

= 0.31

P(lands on 1 or 3) = 0.31 + 0.18

M1 combines P(1) and P(3) and multiplies " " by 200 = 0.49

Est. 200 × "0.49" = 98 times

A1 cao

.....

(Total for Question 17 is 3 marks)

18 On Saturday, some adults and some children were in a theatre.
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$ of the children had seats in the Stalls.
117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?
You must show how you get your answer.

3/4 children Stalls

Stalls	Stalls	Stalls	Circle

← 117 →

B1 either 468 or 1170 seen

total children = 117 × 4
= 468

P1 fully correct process to find total children and adults at theatre

Adults : Children
5 : 2

234

A	A	A	A	A	C

← 468 →

total adults = 234 × 5
= 1170

Total at theatre = total children + total adults
= "468" + "1170"
= 1638

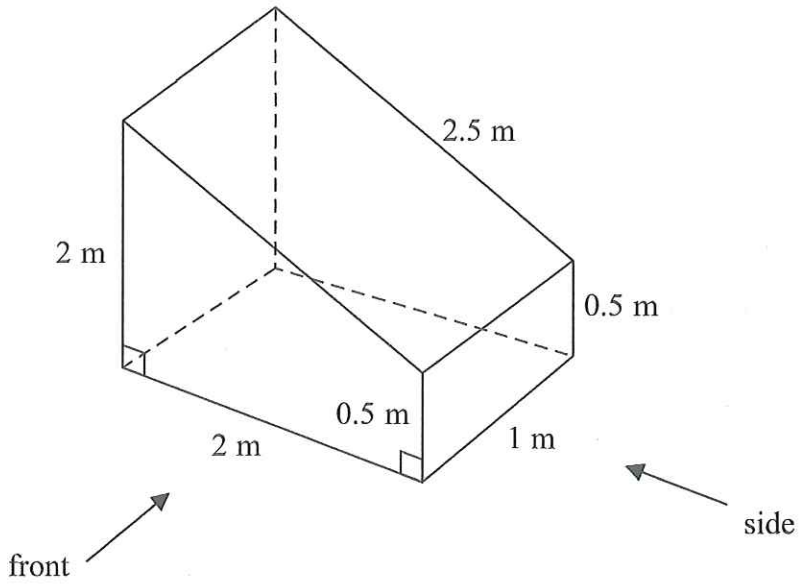
M1 ft finds total of A and C

$\frac{1638}{2600} \times 100 = 63\%$ A1 cao

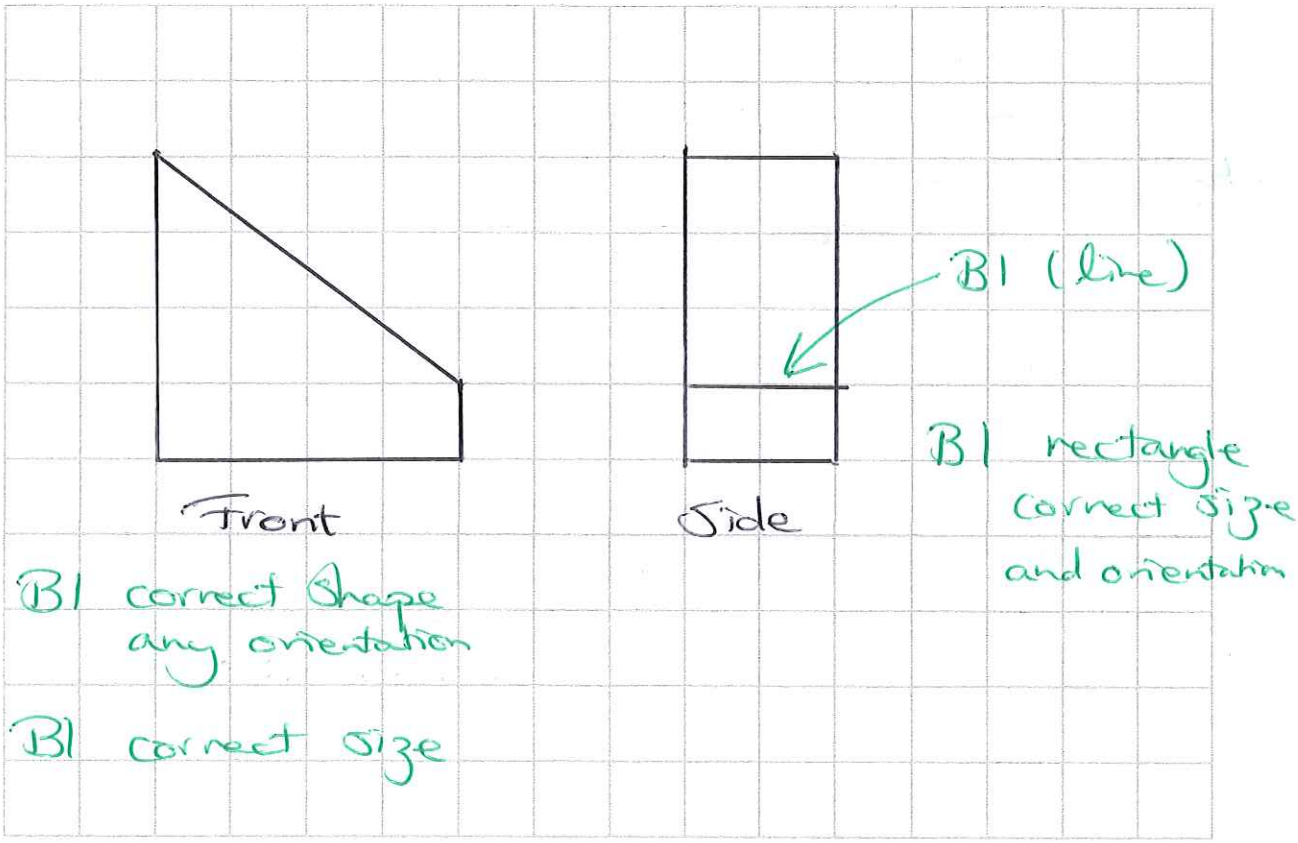
Yes, more than 60% (63%) of seats were taken C1

(Total for Question 18 is 5 marks)

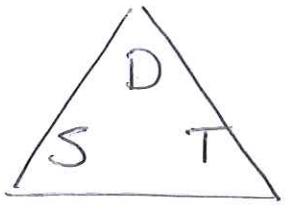
19 The diagram shows a prism with a cross section in the shape of a trapezium.



On the centimetre grid below, draw the front elevation and the side elevation of the prism.
Use a scale of 2 cm to 1 m.



(Total for Question 19 is 4 marks)



20 Olly drove 56 km from Liverpool to Manchester.
He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was 70 km/h.
Olly took 75 minutes to drive from Manchester to Sheffield.

(a) Work out Olly's average speed for his total drive from Liverpool to Sheffield.

L ⟶ M1 ⟶ S

L → M1: D = 56 km, S = 70 km/h
M1 → S: D = 61 km, T = 75 mins = 1.25 hours

use of formula to find time taken L → M: $T = \frac{D}{S} = \frac{56}{70}$

M1

$= 0.8$ hours

$S = \frac{D}{T} = \frac{61}{1.25}$

$= 48.8$ km/h

L ⟶ S

B1 $D = 56 + 61$ calculates total distance $= 117$ km

$T = 0.8 + 1.25$
$= 2.05$ hours B1
calculates total time

$S = \frac{117}{2.05} = 57.1$ (3sf) A1 cao

..... km/h

(4)

any sensible rounding

Janie drove from Barnsley to York.

Janie's average speed from Barnsley to Leeds was 80 km/h.
Her average speed from Leeds to York was 60 km/h.

Janie says that the average speed from Barnsley to York can be found by working out the mean of 80 km/h and 60 km/h.

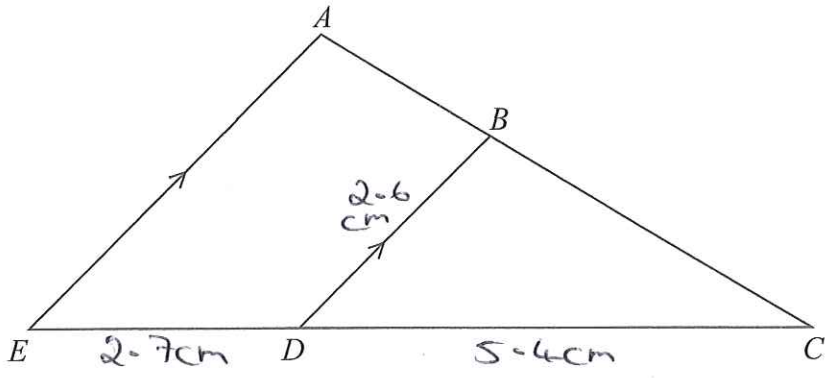
(b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

That the time from Barnsley to Leeds is equal to the time from Leeds to York. C1

(1)

(Total for Question 20 is 5 marks)

21



ABC and *EDC* are straight lines.
EA is parallel to *DB*.

EC = 8.1 cm.
DC = 5.4 cm.
DB = 2.6 cm.

(a) Work out the length of *AE*.

length scale factor = 1·5 B1

$AE = 2.6 \times 1.5$
$= 3.9$

3·9 A1 ..... cm

(2)

AC = 6.15 cm.

(b) Work out the length of *AB*.

$BC = 6.15 \div 1.5$
$= 4.1$ B1

$AB = 6.15 - 4.1$
$= 2.05$

A1
2·05 ..... cm

(2)

(Total for Question 21 is 4 marks)

22 Anil wants to invest £25 000 for 3 years in a bank.

Personal Bank	**Secure Bank**
Compound Interest	Compound Interest
2% for each year	4.3% for the first year 0.9% for each extra year

Which bank will give Anil the most interest at the end of 3 years?
You must show all your working.

Personal Bank: £25000 × 1.02^3 = £26,530.20

Secure Bank: £25000 × 1.043 × 1.009^2 = £26,546.46

M1 any correct 1st step

OR

Personal Bank

Y1 2% of £25000 = £500
£25000 + £500 = £25500

Y2 2% of £25500 = £510
£25500 + £510 = £26010

Y3 2% of £26010 = £520.20
£26010 + £520.20 = £26530.20

interest gained = £1530.20

Secure Bank

Y1 4.3% of £25000 = £1075
£25000 + £1075 = £26075

Y2 0.9% of £26075 = £234.675
£26075 + £234.675 = £26309.675

Y3 0.9% of £26309.675 = £236.787...
£26309.675 + £236.787 = £26546.46

interest gained = £1546.46

Secure bank gives the most interest (£16.26 more than Personal Bank) C1 encourage written comparison but not essential here

A1 both amounts correct

(Total for Question 22 is 3 marks)

23 A number, n, is rounded to 2 decimal places.
The result is 4.76

Using inequalities, write down the error interval for n.

B1 either end correct
B1 fully correct including correct inequality signs

$4.755 \leq n < 4.765$

(Total for Question 23 is 2 marks)

24 Solve $x^2 + 5x - 24 = 0$

P1 correct process to factorise even if signs wrong.

$(x + 8)(x - 3) = 0$ M1 fully correctly factorised

$x + 8 = 0$ or $x - 3 = 0$

$x = -8$ $x = 3$ A1 both values of x correct

.....

(Total for Question 24 is 3 marks)

25 Here are the first six terms of an arithmetic sequence.

−2 , 3 , 8 , 13 , 18 , 23 , 28

+5 +5 +5 +5 +5

(a) Find an expression, in terms of n, for the nth term of this sequence.

B1 5n

$5n - 2$ A1 cao

(2)

The nth term of a different sequence is $3n^2$
Nathan says that the 4th term of this sequence is 144

(b) Is Nathan right?
Show how you get your answer.

$n = 4$, 3×4^2
$= 3 \times 16$
$= 48$

C1 any sensible explanation

no Nathan B not right as the 4th term is 48

(1)

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

• Did you spot Nathan's mistake?
he squared (3×4)

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