

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel
Functional Skills**

Centre Number

Candidate Number

Set 9

Time: 1 hour 30 minutes

Paper Reference **PMAT2/C09**

Mathematics

Level 2

Section B (Calculator)



You must have:

Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, pair of compasses. Tracing paper may be used.

Total Marks

My signature confirms that I will not discuss the content of the test with anyone.

Signature: _____

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.
- Sign the declaration.
- Answer **all** questions.
- Write your final answers in the boxes provided.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You **must** show clearly how you get your answers in the spaces provided. Marks will be awarded for your working out.
- Check your working and answers at each stage.
- 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 3.14

Information

- The total mark for this section is 48.
- The total mark for this paper is 64.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- This sign ☒ shows where marks will be awarded for showing your checks.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

P68474A

©2021 Pearson Education Ltd.

1/1/1/1/1

.CG Maths.
Worked Solutions


Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

SECTION B

Answer ALL questions. Write your answers in the spaces provided.

- 1 Thalia owns a chocolate factory.

The workers in the factory work 7 hours per day.
They produce 65 boxes of chocolate per hour.

Thalia gets an order for 9100 boxes of chocolates.

Work out the number of days needed to produce 9100 boxes of chocolates.

(3)

$$65 \times 7$$

Multiplying the 65 boxes per hour by the 7 hours per day works out that 455 boxes are produced per day

$$9100 \div 455$$

Dividing the 9100 boxes by the 455 boxes per day works out that 20 days are needed

20

(Total for Question 1 is 3 marks)

- 2 Thalia has 6 machines to produce chocolate in her factory.
Each machine produces the same amount of chocolate.

It takes $3\frac{1}{2}$ hours for these 6 machines to produce enough chocolate to fill a crate with chocolate bars.

On Tuesday only 4 of the machines are working.

Work out the number of hours the 4 machines will take to produce the chocolate needed to fill a crate with chocolate bars.

(3)

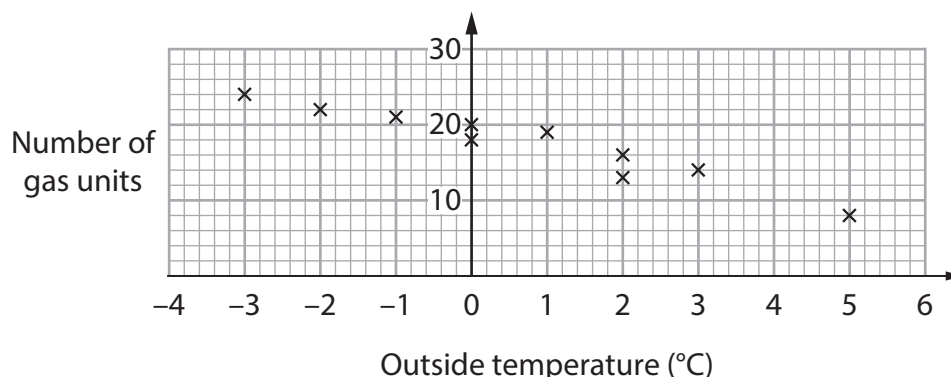
$6 \times 3\frac{1}{2}$ ← Multiplying the 6 machines by the $3\frac{1}{2}$ hours works out that there is 21 hours worth of work to do to fill a crate

$21 \div 4$ ← Dividing the 21 hours worth of work by the 4 machines works out that it will take 5.25 hours

5.25

(Total for Question 2 is 3 marks)

- 3 The scatter diagram shows information about the outside temperature and the number of gas units used to heat a house on each of ten days during January.



The range of the number of gas units used to heat this house each day during October was 11 gas units per day.

Jenson thinks the number of gas units used to heat this house each day is more consistent in October than in the ten days in January.

- (a) Is Jenson correct?
Show why you think this.

(3)

$$24 - 8 = 16$$

Range = largest - smallest. The largest number of gas units in January was 24 and the smallest number of gas units in January was 8. So the range is 16

The range in October was less so was more consistent

Yes

Jenson also thinks there is no relationship between the outside temperature and the number of gas units used to heat this house in these ten days in January.

- (b) Is Jenson correct?
Give a reason for your answer.

(1)

No, there is negative correlation

As one variable (the outside temperature) increases, the other variable (the number of gas units) generally decreases

(Total for Question 3 is 4 marks)

- 4 Kady runs a household waste centre.
Rubbish collected at the centre is either sent for recycling or sent to landfill.

The table shows information about the weight of each type of rubbish sent for recycling last month.

Rubbish type	Weight (tonnes)
Garden waste	224.56
Wood and cardboard	101.81
Metal	37
Glass, soil and rubble	138.9
Electrical	16.54
Other	82.45

The total weight of rubbish collected at the centre last month was 653.64 tonnes.

What percentage of all the rubbish collected last month was sent for recycling?
Give your answer correct to the nearest whole number.

(3)

$$224.56 + 101.81 + 37 + 138.9 + 16.54 + 82.45$$

Adding the weights of all the rubbish types sent for recycling works out that 601.26 tonnes was sent for recycling

$$\frac{601.26}{653.64} \times 100$$

Putting the 601.26 tonnes sent for recycling over the 653.64 tonnes of rubbish expresses the fraction of all the rubbish which is sent for recycling. Multiplying this by 100 converts it to a percentage

91.9... is rounded to the nearest whole number

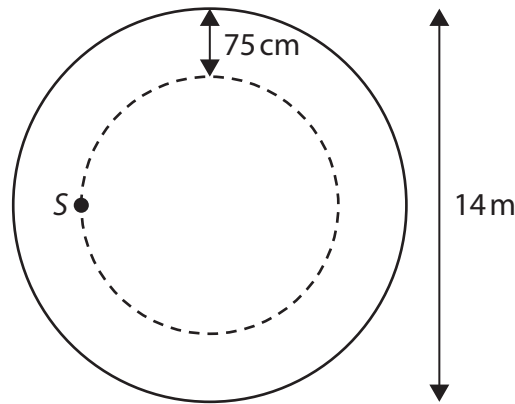
92

%

(Total for Question 4 is 3 marks)

- 5 Natalie will plant flower bulbs on a road roundabout. The roundabout is in the shape of a circle with diameter 14 m.

Natalie will plant the flower bulbs in a circle 75 cm from the edge of the roundabout. The dashed line in the sketch below shows where the flower bulbs will be planted.



Natalie will plant a flower bulb every 25 cm starting from point S.

The flower bulbs are sold in packs. Each pack has 16 flower bulbs.

How many packs of flower bulbs will Natalie need?

(5)

14×100	←	There are 100 cm in 1 m. So multiplying the 14 m by 100 converts it to 1400 cm
$1400 - 75 - 75$	←	Subtracting two lots of the 75 cm works out that the diameter of the circle the bulbs will be planted in is 1250 cm
$\pi \times 1250$	←	Circumference is the distance around the outside of the circle. Circumference = $\pi \times$ diameter
$3926.9... \div 25$	←	Dividing the circumference of the circle the bulbs will be planted in by the 25 cm between each bulb works out that 157.0... bulbs are needed. This is rounded up to 158 as there needs to be a whole number of bulbs
$158 \div 16$	←	Dividing the 158 bulbs by the 16 bulbs in each pack works out how many packs are needed

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9.875 is rounded up to 10 as there needs to be a whole number of packs and 9 packs is not enough

→ 10

(Total for Question 5 is 5 marks)

- 6 Andrew is training to run in the New York Marathon.
The New York Marathon is 26.2 miles long.

The qualifying times to run in the New York Marathon are shown in the table below.

Age (years)	Time (hours : mins)
18 – 34	2 : 53
35 – 39	2 : 55
40 – 44	2 : 58
45 – 49	3 : 05
50 – 54	3 : 14
55 – 59	3 : 23
60 – 64	3 : 34
65 – 69	3 : 45
70 – 74	4 : 10
75 – 79	4 : 30
80 +	4 : 55

Andrew is 51 years old.
His current average running speed is 8 miles per hour.

Andrew thinks he will need to run at a faster speed to be able to qualify for the New York Marathon.

Is Andrew correct?
Show why you think this.

(3)

$\begin{matrix} d \\ s \end{matrix} t$ ← Writing the formula triangle for speed, distance, time

$26.2 \div 8$ ← Covering t in the formula triangle finds that time = distance ÷ speed. So it will take 3.275 hours

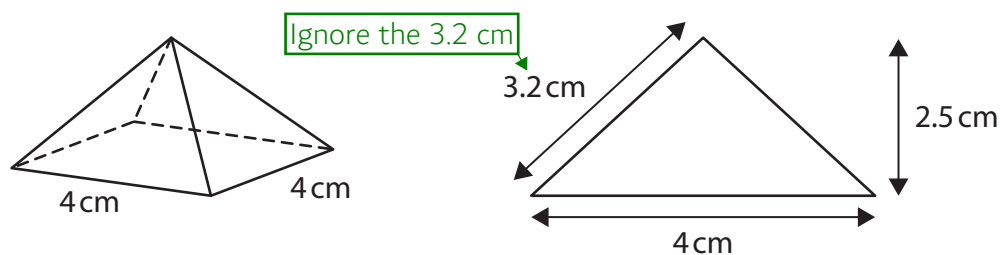
$3 : 16$ ← Using the calculator to convert 3.275 hours to hour and minutes. Ignoring the 30 seconds

$3 : 16$ is more than the qualifying time of $3 : 14$.
So he will have to run at a faster speed

Yes

(Total for Question 6 is 3 marks)

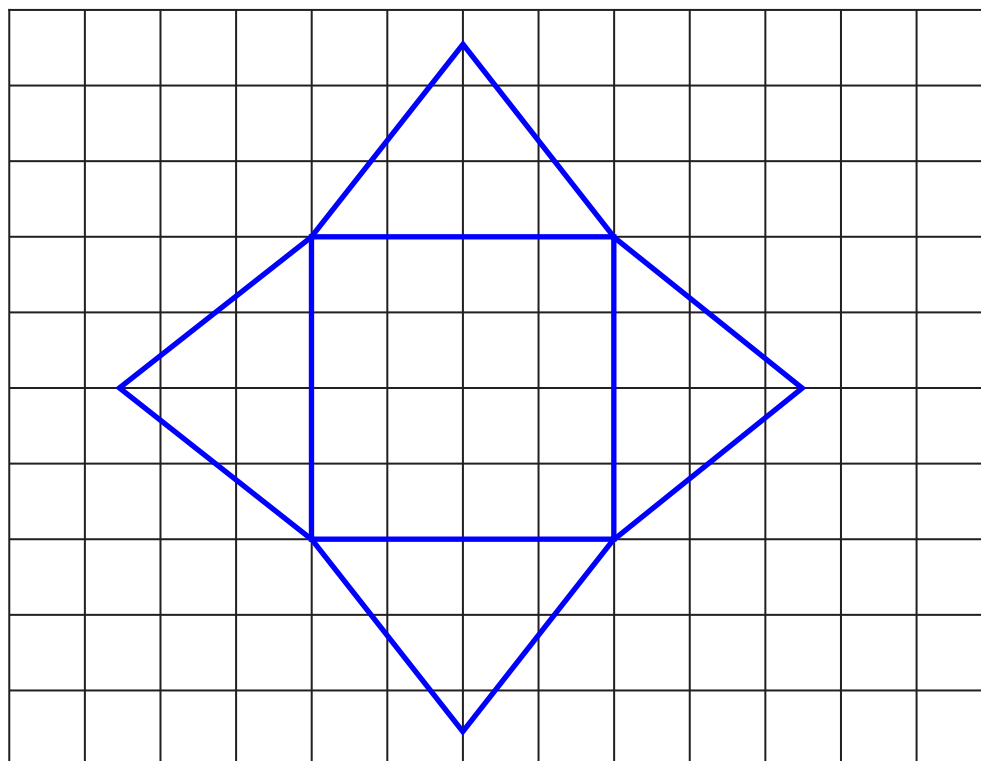
- 7 Here is a sketch of a square based pyramid and one of the triangular faces.



- (a) Draw an accurate net of this pyramid on the centimetre grid below.

A 2D representation which can be folded to get the 3D shape

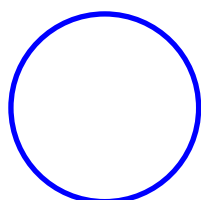
(3)



The base of a tin of paint is placed on the floor.
The tin of paint is in the shape of a cylinder.

- (b) Draw a sketch of the plan view of the tin of paint.

(1)



A view from above

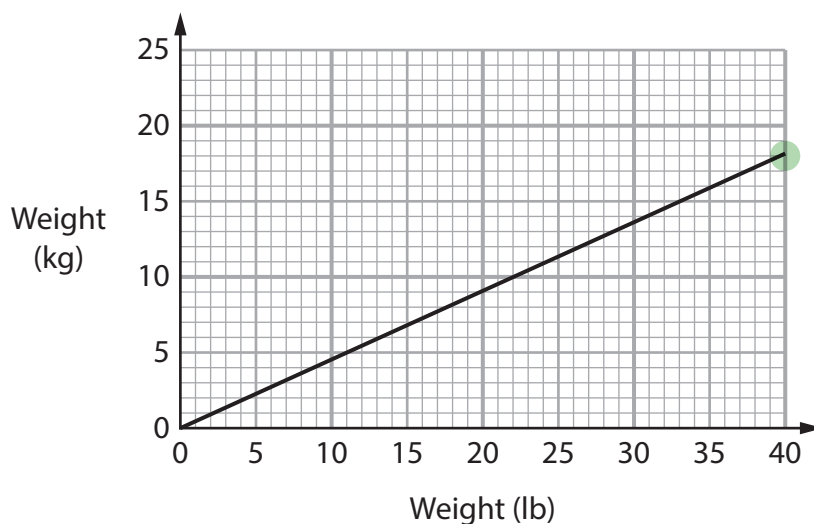


(Total for Question 7 is 4 marks)

- 8 Dave needs to make 3500 lbs of concrete mix using cement, sand and gravel. He will mix cement, sand and gravel in the ratio 1 : 2 : 5 by weight.

Cement, sand and gravel are sold in kilograms.

Dave uses this graph to convert between lb and kg.



- (a) Work out the weight, in kilograms, of cement, of sand and of gravel that Dave needs to buy.
You **must** show your working.

(5)

$18 \div 40$	←	From the graph, 40 lbs = 18 kg. So dividing the 18 kg by 40 works out that 1 lb = 0.45 kg
3500×0.45	←	Multiplying the 3500 lbs by 0.45 converts it to 1575 kg
$1575 \div 8$	←	$1 + 2 + 5 = 8$ parts in total in the ratio which represent the 1575 kg. So dividing the 1575 kg by 8 works out that 1 part of the ratio is worth 196.875 kg. This is the weight of the cement
196.875×2	←	Multiplying the value of 1 part of the ratio by 2 works out that the 2 parts representing the sand is 393.75 kg
196.875×5	←	Multiplying the value of 1 part of the ratio by 5 works out that the 5 parts representing the gravel is 984.375 kg

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Cement196.875..... kg

Sand393.75..... kg

Gravel984.375..... kg



(b) Show a check of your ratio calculation.

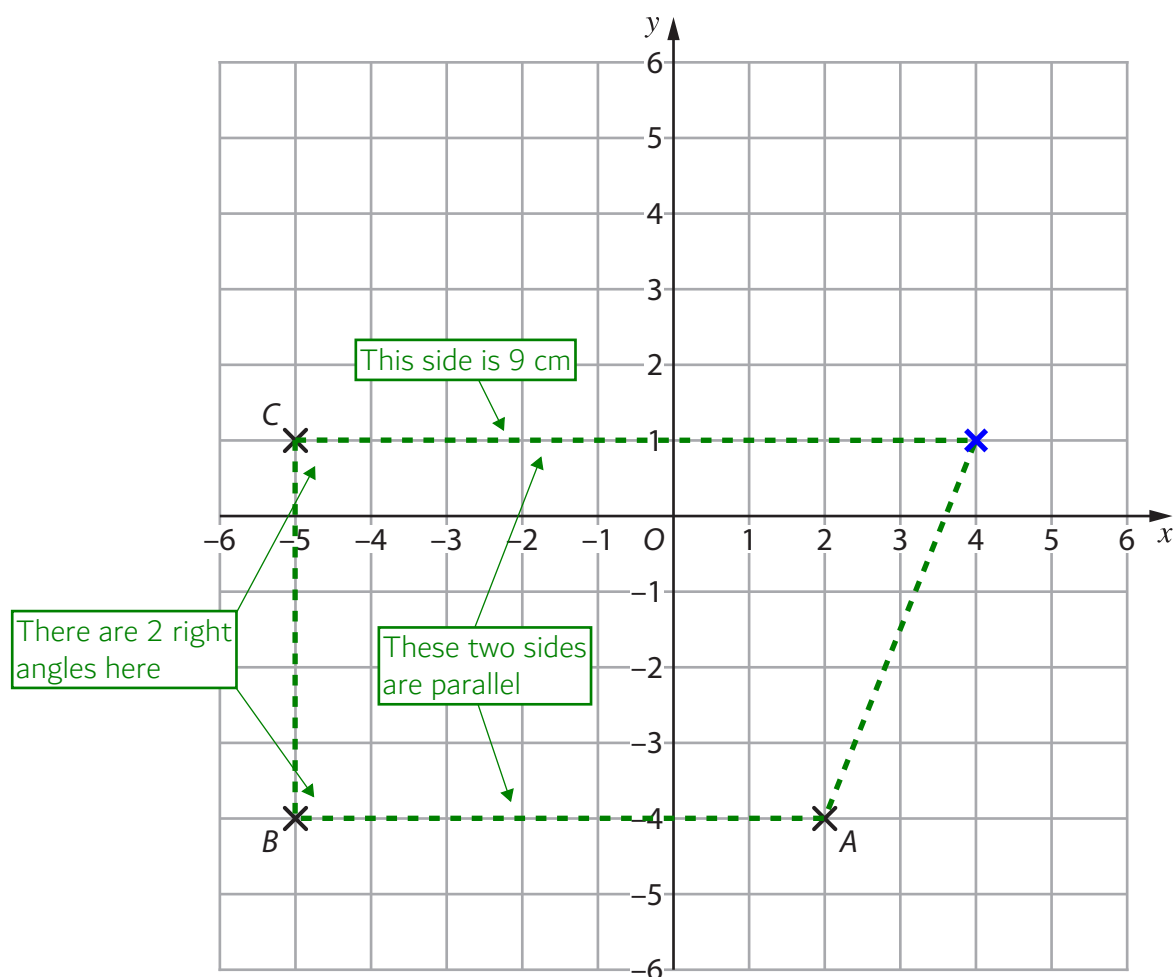
(1)

$$196.875 + 393.75 + 984.375 = 1575$$

Adding the weights of the cement, sand and gravel gives the weight of the concrete

(Total for Question 8 is 6 marks)

9 Here is a centimetre grid.



(a) Write down the coordinates of point B .

(1)

x-coordinate	y-coordinate
(-5)	(-4)

D is a point on the grid.

The trapezium $ABCD$ has

- exactly 2 right angles
- one side of length 9 cm.

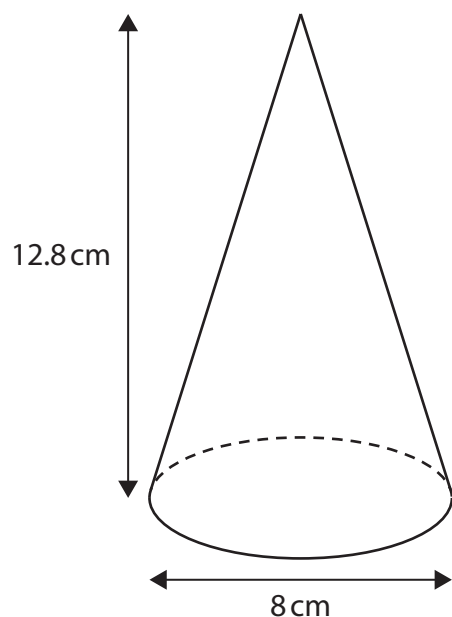
(b) Plot a possible position for point D on the grid.

(2)

A trapezium is a four-sided shape with one pair of parallel sides

(Total for Question 9 is 3 marks)

10 Here is a cone.



$$V = \frac{1}{3} \pi r^2 h$$

V is the volume

r is the radius of the base of the cone

h is the vertical height

Work out the volume of this cone.
Remember to state the units.

$$\frac{1}{3} \times \pi \times 4^2 \times 12.8$$

The radius is 4 cm as it is half of the diameter of 8 cm.
Substituting 4 for r and 12.8 for h in the formula

(3)

$$214.5 \text{ cm}^3$$

(Total for Question 10 is 3 marks)

- 11 Darius restores old furniture.
He has 12 chairs and 3 tables to restore.

Darius writes a list of the costs to restore all of the chairs and all the tables.

Costs	
tables and chairs	free
7 tins of wood oil	£12.50 each
10.5 metres fabric	£6.90 per metre
foam cushions	£82.50

Darius sells each table for £127 and each chair for £32

Work out the percentage profit Darius makes after selling all the chairs and all the tables.

Give your answer correct to 1 decimal place.

(5)

$$12.50 \times 7 = 87.50$$

Multiplying the £12.50 cost of each tin of wood oil by the 7 tins of wood oil works out that the tins of wood oil cost £87.50

$$6.90 \times 10.5 = 72.45$$

Multiplying the £6.90 cost per metre of fabric by the 10.5 metres of fabric works out that the fabric costs £72.45

$$87.50 + 72.45 + 82.50 = 242.45$$

Adding the cost of the wood oil, the fabric and the foam cushions works out that the costs to restore all the chairs and tables is £242.45

$$32 \times 12 = 384$$

Multiplying the £32 price of each chair by the 12 chairs works out that the chairs are sold for £384

$$127 \times 3 = 381$$

Multiplying the £127 price of each table by the 3 tables works out that the tables are sold for £381

$$384 + 381$$

Adding the £384 the chairs are sold for and the £381 the tables are sold for works out that the total income from selling the chairs and tables is £765

$$765 - 242.45$$

Subtracting the £242.45 costs to restore all the chairs and tables from the £765 income from selling them works out that the profit is £522.55

$$\frac{522.55}{242.45} \times 100$$

Putting the £522.55 profit over the £242.45 costs expresses the fraction profit. Multiplying this by 100 converts it to a percentage

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

215.52... % is rounded to 1 decimal place → 215.5 %

(Total for Question 11 is 5 marks)

12 Jasmine is doing a survey about learning to drive.

The table shows information about the number of driving lessons 60 people had before passing their driving test.

Number of driving lessons	Frequency		
1 to 15	6	8	48
16 to 30	18	23	414
31 to 45	25	38	950
46 to 60	11	53	583
			1995

Jasmine estimates that the mean number of driving lessons these people had before passing their driving test is more than 35 lessons.

(a) Is this estimate of the mean correct?

Show why you think this.

(3)

A: Writing the midpoint of each category as this is the best estimate for the number of driving lessons by each person in each category. The midpoint can be worked out by doing the mean of the lowest and highest amount in each category. For example for the 1 to 15 category: $1 + 15 = 16$ then $16 \div 2 = 8$.

B: Multiplying the frequency by the midpoints of each category works out an estimated total number of driving lessons for each category.

C: Adding all of the estimated totals gives an overall estimated total of 1995 lessons. Dividing this by the 60 people works out that the estimated mean is 33.25 lessons

33.25 is not more than 35

No



(b) Use a reverse calculation to show a check of your answer.

(1)

$$33.25 \times 60 = 1995$$

One of these 60 people is chosen at random.

(c) What is the probability that this person had more than 30 lessons before passing their driving test?

Give your answer as a decimal.

(2)

$$25 + 11$$

Adding the 25 who had 31 to 45 lessons and the 11 who had 46 to 60 lessons works out that 35 people had more than 30 lessons

$$\frac{36}{60}$$

36 out of the 60 people had more than 30 lessons

Using the calculator to format the fraction as a decimal

0.6

(Total for Question 12 is 6 marks)

TOTAL FOR SECTION B IS 48 MARKS
TOTAL FOR PAPER IS 64 MARKS