

Please check the examination details below before entering your candidate information

Candidate surname

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**Pearson Edexcel
Functional Skills**

Centre Number

Candidate Number

**Practice exam paper for first teaching
September 2019**

Time: 1 hour 30 minutes

Paper Reference **PRACL2/01**

**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 your answers at each stage.
- Diagrams are **not** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button take the value of π to be 3.14
- **Calculators may be used.**

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 ►

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.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 indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

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

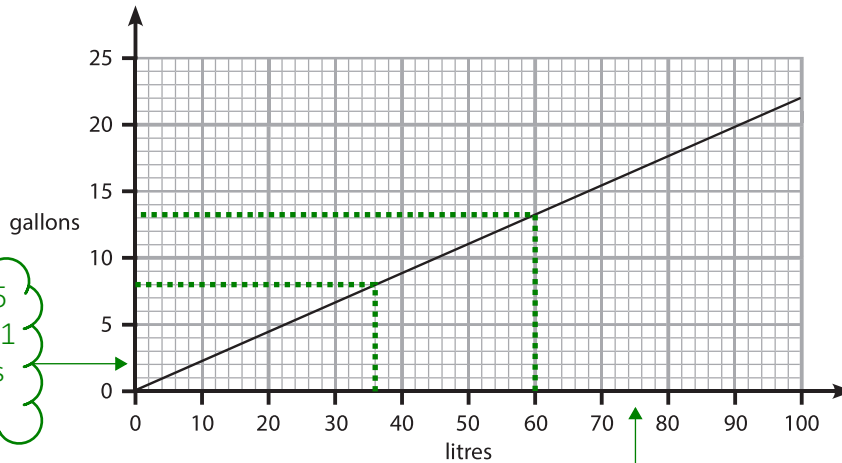
Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

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 This graph can be used to convert between gallons and litres.



This scale goes up 5 over 5 boxes. $5/5 = 1$ so each small box is worth 1

This scale goes up 10 over 5 boxes. $10/5 = 2$ so each small box is worth 2

(a) Convert 60 litres to gallons.

Reading up from 60 litres to the line then across to the gallons. It is slightly above 13 but we can give the reading to the nearest half a box

(1)

13 gallons

One day

- Anaya used 44 litres of fuel
- Meera used 8 gallons of fuel.

Anaya used more fuel than Meera.

(b) Use the graph to work out how much more. Remember to give units with your answer.

$44 - 36$

Reading across from 8 gallons to the line then down to the litres finds that 8 gallons is equivalent to about 36 litres. Working out the difference between what Anaya used and Meera used works out how much more they used. Difference = largest - smallest

8 litres

(Total for Question 1 is 3 marks)

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2 David reads this advert on his county council website.

70% of the area of woodland in the county is native woodland.
This means there are 350 km² of native woodland in the county.

Work out the area of woodland in the county that is **not** native woodland.

(3)

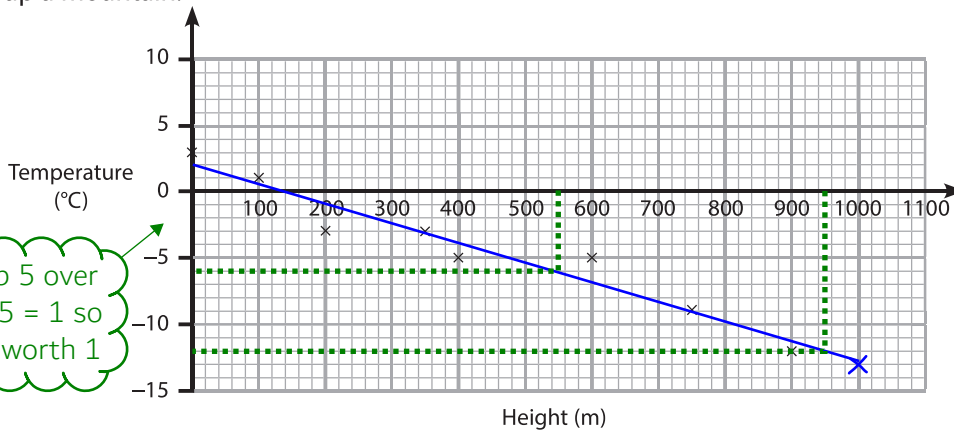
$$\frac{350}{70} \times 30$$

If 70% is native woodland, 30% must be not native woodland as percentage is out of 100 and $100 - 70 = 30$. Dividing the area of the native woodland by 70, as it is represented by 70% of the woodland, works out how much area 1% of the woodland is. Multiplying this by 30 works out the 30% which is not native woodland

150 km²

(Total for Question 2 is 3 marks)

- 3 The scatter diagram gives information about the temperatures at 8 different heights up a mountain.



The scale goes up 5 over 5 small boxes. $5/5 = 1$ so each small box is worth 1

At a height of 1000 m the temperature is -13°C .

(a) Plot this information on the scatter diagram. (1)

(b) Draw a line of best fit on the scatter diagram. (1)

(c) Use the line of best fit to estimate the difference between the temperature at a height of 550 m and at a height of 950 m. (2)

$-6 - -12$

Reading down from 550, which is halfway between 500 and 600, to the line then across to the temperature works out an estimate of the temperature at 550m. This is -6. Reading down from 950, which is halfway between 900 and 1000, to the line then across to the temperature works out an estimate of the temperature at 950m. This is -12. Difference = largest - smallest

6 °C

(Total for Question 3 is 4 marks)

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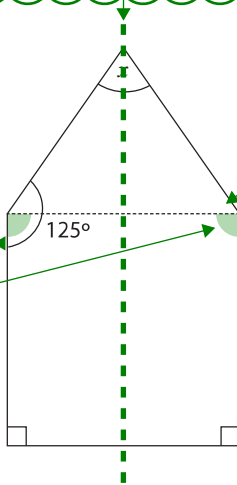
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4 Here is a pentagon.

The line of symmetry must be here



As the pentagon is symmetrical, this angle must also be 125 degrees

This shape must be a rectangle in order for the line of symmetry to work and for there to be two 90 degree angles at the base. Therefore these two angles must be 90 degrees

The pentagon has one line of symmetry.

Work out the size of the angle marked x .

(3)

$$125 - 90$$

$$180 - 35 - 35$$

The shape on top is a triangle. Subtracting the 90 degrees from the 125 degree angles works out both of the base angles of the triangle. Subtracting both of these angles from 180, as there are 180 degrees in total in a triangle, leaves x

110°

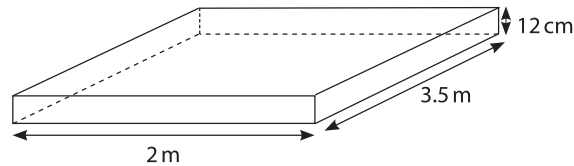
(Total for Question 4 is 3 marks)

5 Nicola wants to put a flat roof on a bike store.

The roof will be

- made of concrete
- in the shape of a cuboid as shown.

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$



Nicola wants to put a metal strip along 2 of the longest edges of the roof.

She knows

- the density of concrete is 2300 kg per m³
- the mass of 1 metre of metal strip is 5 kg.

Work out the total mass of the concrete and the strips she wants.

$$2300 \times 3.5 \times 2 \times \frac{12}{100} + 5 \times 3.5 \times 2$$

(5)

The mass of the concrete. From the formula for the density, multiplying both sides by the volume makes the mass the subject and gives mass = density x volume. The shape is a cuboid and volume of a cuboid = length x width x height.

There are 100cm in 1m so dividing the 12cm by 100 converts it into metres. This needs to be done as the density is in kg per m³ so the volume needs to be in m³, meaning that each of the lengths need to be in metres when working it out

The mass of the metal strips. The 3.5m lengths are the longest edges of the roof and the metal strips are going to be put along these. 3.5 x 2 works out the total length of these. As the mass of 1 metre of metal strip is 5kg, multiplying the total length of the two edges in metres by 5 works out the mass of the metal strips

Adding the mass of the concrete and the mass of the metal strips gives the total mass

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1967 kg

(Total for Question 5 is 5 marks)

6 Mai has this information about 100 flowering plants in her shop.

		Stem length	
		Short	Long
Size of flower	Small	10	18
	Large	43	29

29 have a large flower and a long stem

She will take a plant at random from these plants.

43 of the plants with large flowers have short stems

(a) Work out the probability that this plant will have a large flower and a long stem.

(2)

29 out of the total 100 plants have a large flower and a long stem

$$\frac{29}{100}$$

Mai will take at random a plant from the 72 plants that have a large flower.

(b) Work out the probability that this plant will have a short stem.

(1)

43 out of the 72 plants that have a large flower have a short stem

$$\frac{43}{72}$$

(Total for Question 6 is 3 marks)

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- 7 Sal works in a dress shop. She wants to know how well the labels on the dress hangers agree with the true size of the dresses.

The table shows information about some hangers and dresses.

		True size of dress				
		10	12	14	16	18
Label on hanger	10	8	2	1	1	-
	12	-	9	3	1	2
	14	2	1	12	-	-
	16	1	-	1	13	2
	18	1	1	2	1	13
Totals		12	13	19	16	17

$12 + 13 + 19 + 16 + 17 = 77$

So there are 77 dresses in total

Sal thinks that 2 in every 7 dresses are on hangers with the wrong label.

The boxes highlighted in green are the numbers of dresses on hangers with the correct label

Is Sal correct?
Show clearly why you think this.

$$\frac{77 - 8 - 9 - 12 - 13 - 13}{77} = \frac{2}{7}$$

(4)

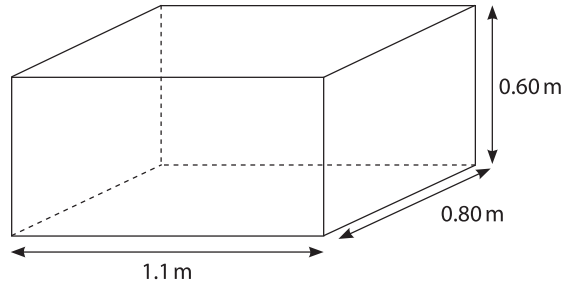
Subtracting the numbers of dresses on hangers with the correct label from the number of dresses in total leaves the number of dresses on hangers with the wrong label. Putting this over the total number of dresses expresses the fraction of the dresses which are on hangers with the wrong label. This is equal to $\frac{2}{7}$ which is the same as 2 in every 7 so Sal is correct.

Yes

(Total for Question 7 is 4 marks)

- 8 James has a contract to paint 30 identical water tanks. He has to paint the outside surfaces of each tank, but not the top.

Each surface is rectangular.



James knows that 1 tin of paint

- is enough to cover 12 m^2 of surface
- costs £26.99

Work out the total cost of the tins of paint he will need for all 30 water tanks.

$$30(1.1 \times 0.80 + 2 \times 0.80 \times 0.60 + 2 \times 1.1 \times 0.60)$$

(6)

12

Area of rectangle = length \times width. 1.1×0.80 works out the area of the bottom face. 0.80×0.60 works out the area of the right face and is multiplied by 2 as the area of the left face is the same. 1.1×0.60 works out the area of the front face and is multiplied by 2 as the area of the back face is the same. Adding all of these areas together gives the total area of the surfaces needed to be painted on one of the water tanks.

Multiplying this by 30 gives the area of the surfaces needed to be painted on all of the 30 water tanks. Dividing this by the 12 m^2 which 1 tin of paint covers works out how many tins of paint are needed

$$8 \times 26.99$$

The 7.9 tins is rounded up to 8 as there needs to be a whole number of tins. Multiplying this by the £26.99 works out the total cost of the tins of paint he will need

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£ 215.92

(Total for Question 8 is 6 marks)

- 9 Andros has an oil fired heating system.
In a 30-day period he used a full tank of oil at a constant rate per day.

At a different time of the year the amount of oil Andros uses per day is $\frac{1}{3}$ of the rate used in the 30-day period.

- (a) How many days should a full tank of oil last at this new rate? (2)

s^d_t

This is basically a speed, distance, time problem so writing down the formula triangle

$$\frac{1}{\left(\frac{1}{3}\right)} = 3$$

By covering over t in the formula triangle, it tells us that time = distance/speed. The distance is basically how much oil there is and this can be set to 1 as there is 1 tank of oil. The speed is basically the rate the oil is used, which can be set to $\frac{1}{3}$ as it was $\frac{1}{3}$ of the rate used previously. This tells us that the time is 3 times as long as previously

$$30 \times 3$$

Multiplying the original 30 days it lasted for by the 3 works out how long it should last at this new rate

90

days



- (b) Use reverse calculation to show a check of your answer. (1)

$$\frac{90}{30} = 3$$

This shows that the 90 days is 3 times more than the 30-day period

$$\frac{1}{3} = \frac{1}{3}$$

Speed = distance/time so dividing the 1 tank of oil, which is basically the distance, by the time, which can be set to 3, gives the speed which is the rate in which it is used

(Total for Question 9 is 3 marks)

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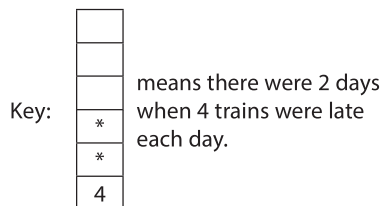
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10 Lena recorded the number of late trains at a station in a day over a period of time.

She shows this information in a diagram.

Number of days	5									
	4		*							
	3		*	*						
	2	*	*	*	*	*				
	1	*	*	*	*	*	*			*
		1	2	3	4	5	6	7	8	9
		Number of late trains in a day								



(a) For this information work out the median number of late trains in a day.

(2)

x, x, 2, 2, 2, 2, 3, 3, 3, 4, 4, 5, 5, 6, 9

Writing out the number of late trains in a day in an ordered list then finding the middle number by crossing off one from each end until there is one left in the middle. 3 is in the middle so therefore it is the median

3

Lena says 'The median number of late trains in a day, from this information, is a good estimate of the average number of trains late over the period of time.'

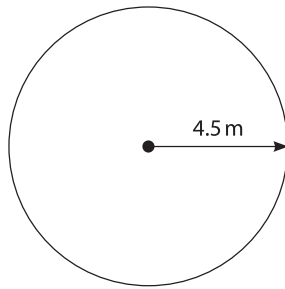
(b) Is Lena correct?
Explain why you think this.

(1)

Yes as the median is a type of average

(Total for Question 10 is 3 marks)

- 11 Joanna is a landscape gardener.
She has to fill a circular space with flowers.



The radius of the circular space is 4.5 metres.

Joanna will plant 40 flowers per square metre of space.

She will plant 4 times as many red flowers as white flowers.

How many red flowers will she plant?

4:1

This is the ratio of red flowers to white flowers

(5)

$$\frac{\pi \times 4.5^2 \times 40}{4+1} \times 4$$

Area of circle = πr^2 , where r is the radius. $\pi \times 4.5^2$ works out the area of the circle in square metres. Multiplying this by the 40 flowers per square metre works out how many flowers are to be planted. $4 + 1$ works out how many parts there are in total in the ratio and these represent the total number of flowers. So dividing by this works out what one part of the ratio represents. Multiplying all of this by 4 works out how much the 4 parts of the ratio which represents the number of red flowers is

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2035.75204 is rounded to the nearest whole number as there can't be a decimal of a flower

2036

(Total for Question 11 is 5 marks)

12 Jim owns a small business.

The table shows information about the weekly wage of the 40 workers.

Weekly wage (£)		Number of workers	
320	X	10	= 3200
370	X	13	= 4810
420	X	8	= 3360
470	X	7	= 3290
520	X	2	= 1040

$$15700 \div 40$$

Jim wants to increase the mean wage by 4%, plus £10

Jim thinks the new mean weekly wage of these workers will be more than £415

Is Jim correct?
You **must** show your working.

(6)

Multiplying the weekly wage by the number of workers works out the total weekly wage for each category. Adding these all together works out the total weekly wage of all of the workers. Dividing this by the 40 workers gives the mean weekly wage of each worker.

$$\frac{392.50}{100} \times 104 + 10 = 418.20$$

The mean weekly wage of the workers is £392.50. Dividing this by 100 works out 1% then multiplying by 104 works out 104%, which is an increase of 4%. Adding the £10 to this works out what the new weekly wage would be

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£418.20 is more than
£415 so Jim is correct

Yes

(Total for Question 12 is 6 marks)

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