

Write your name here

Surname

Other names

**Pearson Edexcel
Functional Skills**

Centre Number

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Candidate Number

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Mathematics

Level 2



6 – 10 February 2017

Time: 1 hour 30 minutes

Paper Reference

FSM02/01

You must have:

Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, compasses.

Total Marks

--

My signature confirms that I will not discuss the content of the test with anyone until the end of the 5 day test window.

Signature: _____

Instructions

- Use a **black** 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.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 48.
- The marks for each question are shown in brackets – *use this as a guide to how much time to spend on each question.*
- **You must show clearly how you get your answers because marks will be awarded for your working out.**
- **Check your working and your answers at each stage.**
- **This sign shows where marks will be awarded for showing your check.**



Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.

Turn over ►

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Pearson

SECTION A: Activity holiday centre

Answer all questions in this section.

Write your answers in the spaces provided.

- 1** Rose is the manager of the cafe at an activity holiday centre. She wants to put solar panels on the roof of the cafe.

Rose knows that the amount of electricity that a solar panel produces depends on the angle of the roof.

This table shows the percentage of the maximum electricity that a solar panel produces for different roof angles.

Angle of the roof (°)	0	10	20	30	40	50	60	70	80	90
Percentage of maximum electricity a solar panel produces	93	97	99	100	96	94	87	79	72	65

Rose knows that

- the angle of the roof of the cafe is 50°
- each solar panel produces a maximum of 250 watts of electricity
- the cafe needs 8 kilowatts of electricity
- 1 kilowatt = 1000 watts.

She thinks that 33 solar panels will be enough to produce 8 kilowatts of electricity.

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

(4)

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Rose uses part-time staff in the morning and the evening at the cafe.

She needs

- 2 people working from 7 am to 9 am
- 3 people working from 5 pm to 9 pm
- 1 person working from 9 pm to 10 pm.

The table gives information about when these part-time staff can work.

Name	Times available	Hours each day
Ally	morning only	2
Ben	from 7 pm	3
Col	from 5 pm	4
Dan	any time	5
Ellie	from 5 pm	3

Staff must work in blocks of time of at least 1 hour.

Rose needs to make a staff rota.

(b) Make a staff rota for Rose.

(3)

Complete the table below.

	7 – 8am	8 – 9am	5 – 6pm	6 – 7pm	7 – 8pm	8 – 9pm	9 – 10 pm
Ally							
Ben							
Col							
Dan							
Ellie							

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Here is a record of the income and the costs of the cafe for 6 weeks in the summer.

Income (£)	4700	8750	8750	9600	9400	9800
Costs (£)	5200	5800	5800	5800	5800	5800

Rose thinks that the mean profit per week is more than £3000

- (c) Is Rose correct?
Show why you think this.

(4)

Use the box below to show clearly how you get your answer.

(Total for Question 1 is 11 marks)

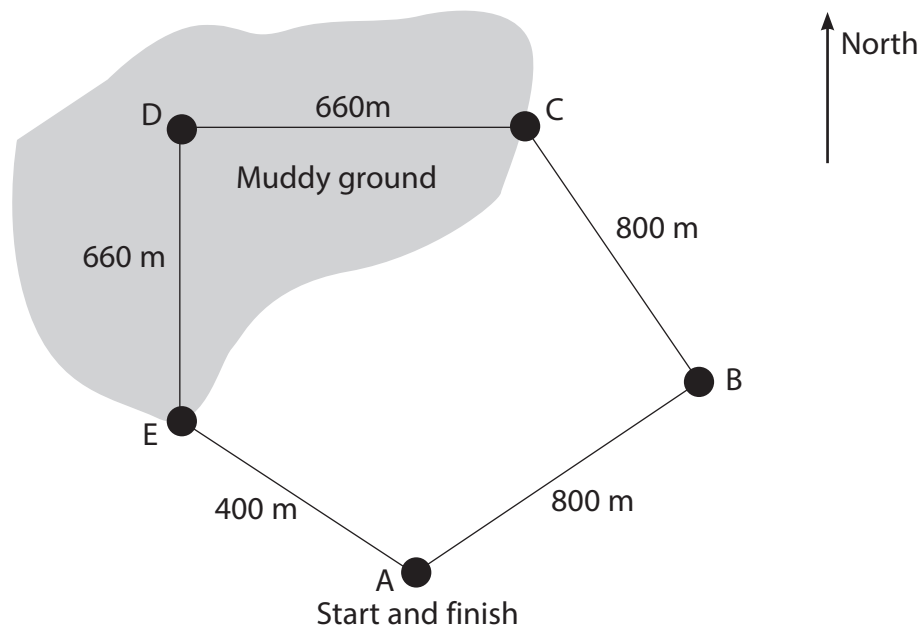


- 2 Zara is the events manager at the activity holiday centre. She has to plan the course for a cross-country race for children.

The course has

- a start and finish at A
- 4 checkpoints B, C, D and E
- muddy ground between C and D
- muddy ground between D and E
- firm ground in all other places.

Zara draws this sketch of the course.



Zara knows that an ordinary runner will run at a speed of 80 m per minute on firm ground.

On muddy ground their speed will be $\frac{3}{4}$ of their speed on firm ground.

Work out the time in minutes it will take an ordinary runner to complete the course.

Show a check of your working.

(5)

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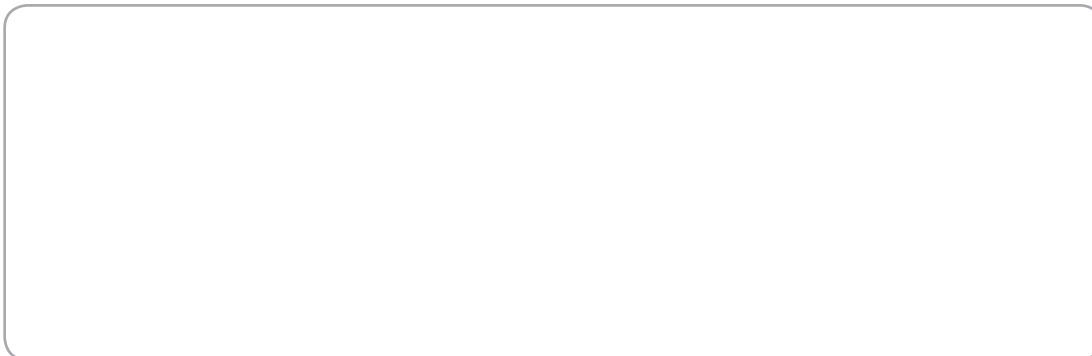
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Use the box below to show clearly how you get your answer.



Use the box below to show your check.



(Total for Question 2 is 5 marks)



SECTION B: Olivia's organics

Answer all questions in this section.

Write your answers in the spaces provided.

- 3 Olivia owns some land.
She wants to grow potatoes in one of her fields.

Olivia draws this diagram of the field.
She marks the position of some of the potato plants.

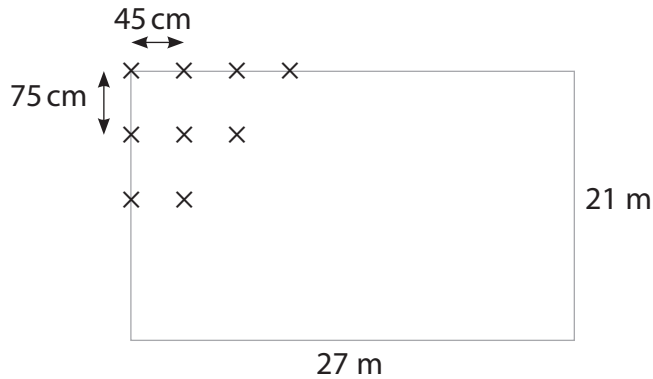


Diagram **not** accurately drawn

Key
x = 1 potato plant

The field is rectangular 27 m by 21 m.

Olivia wants to grow the potato plants in rows.
She knows that

- the gap between each row of potato plants must be 75 cm
- the gap between each potato plant in any row must be 45 cm
- each potato plant should produce $1\frac{1}{2}$ kg of potatoes
- 1 metric tonne = 1000 kg.

Work out the total weight of potatoes that Olivia should get from this field.
Give your answer in metric tonnes correct to 1 decimal place.

(6)

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Use the box below to show clearly how you get your answer.



(Total for Question 3 is 6 marks)

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4 Olivia uses seaweed concentrate to make liquid fertiliser for her raspberry plants.

She reads these instructions.

Add water to 50 ml of concentrate to make 10 litres of fertiliser.
Use 10 litres of fertiliser for every 12 raspberry plants.

Olivia has 180 raspberry plants.
She has 800 ml of concentrate.

Does Olivia have enough concentrate for 180 raspberry plants?
Show why you think this.

(3)

Use the box below to show clearly how you get your answer.

(Total for Question 4 is 3 marks)

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5 Olivia is going to make compost bins to hold compost.

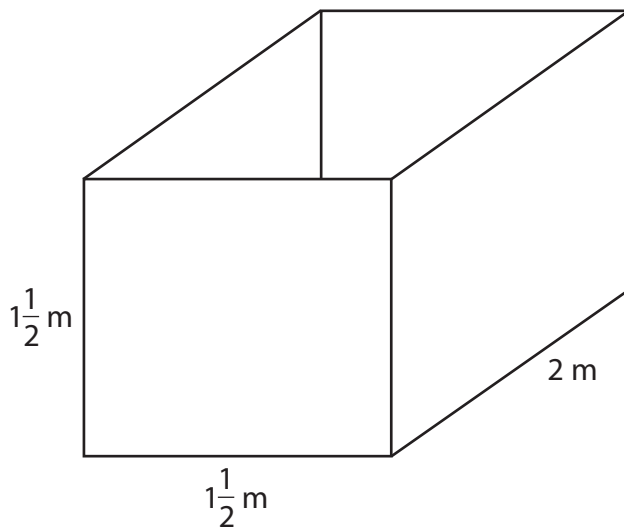


Diagram **not** accurately drawn

Each compost bin is in the shape of a cuboid with width $1\frac{1}{2}$ m, length 2 m and depth $1\frac{1}{2}$ m.

Work out the volume of a compost bin.
Show a check of your working.

(3)

Use the box below to show clearly how you get your answer.

Use the box below to show your check.



(Total for Question 5 is 3 marks)



6 Olivia wants to put 3 identical greenhouses on a patch of land.


The space for each greenhouse must

- be in the shape of a rectangle
- have an area of 32 m^2
- be at least 1 m from the edge of the patch of land
- be at least 1 m from any other greenhouse.

On the grid opposite draw spaces for each of the greenhouses for Olivia.

(4)

Use the box below to show any working.



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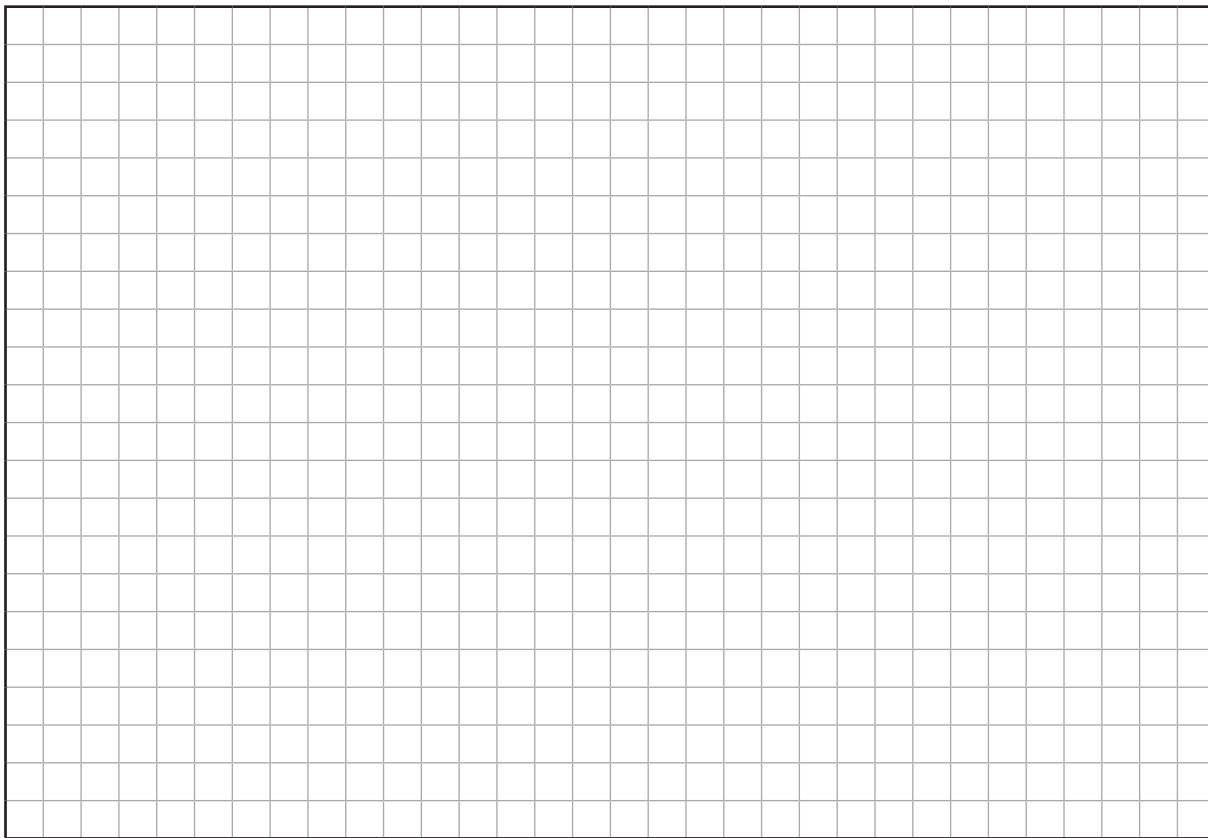
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Key 1 square on the grid is 50 cm by 50 cm on the patch of land
— edge of the patch of land



(Total for Question 6 is 4 marks)



SECTION C: Polar Frozen Foods

Answer all questions in this section.

Write your answers in the spaces provided.

- 7 Polar Frozen Foods (PFF) manufactures and delivers frozen meals to care homes. It is part of a large international company. Each time PFF develops a new food product it asks people whether they like it or not. The data collection sheet gives information about one new product.

	Opinion			Total
	Good	Satisfactory	Poor	
Men	16	24	10	50
Women	28	14	18	60

Henry is the marketing manager of PFF. He says

The survey shows that the percentage of women who like the new product is higher than the percentage of men who like the new product.

Is Henry correct?
Explain why you think this.

(3)

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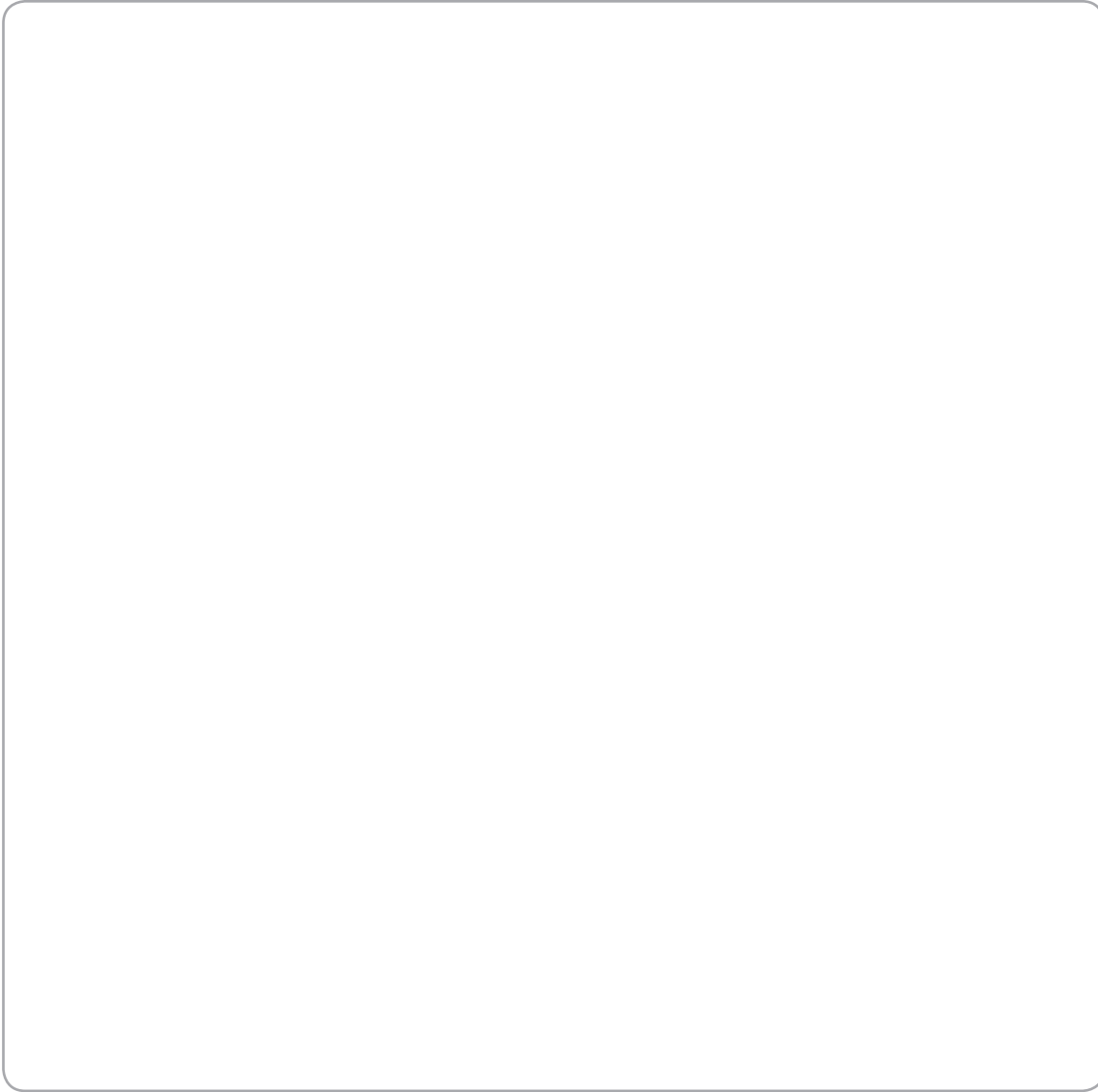
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(Total for Question 7 is 3 marks)

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8 Freya is the production manager.

There are 125 staff making food at Polar Frozen Foods.
Each of them works 35 hours a week.

Freya is going to raise the hourly rate of these staff from £7.20 per hour to £8.25 per hour.

She also wants to increase the number of staff making food by 8%.
They will be paid £8.25 per hour and will also work 35 hours a week.

(a) Calculate the increase in the total amount of money the company will have to pay the staff making food each week.

(6)

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Freya wants to compare the price of a meal in the UK with the price of a similar meal in France.

In the UK the price of 20 meals is £110

In France the price of 24 meals is 180 euros.

Freya knows that £1 = 1.22 euros.

(b) Is the price of a meal lower in the UK or France?
Show why you think this.

(4)

Use the box below to show clearly how you get your answer.

(Total for Question 8 is 10 marks)

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9 Freya wants to compare food storage methods between the UK and the USA.

She compares the temperature at which frozen meals are stored in the UK with the temperature at which they are stored in the USA.

Temperature is measured in degrees Fahrenheit in the USA.

Freya knows this formula.

$$F = 1.8C + 32$$

F is the temperature in degrees Fahrenheit
C is the temperature in degrees Celsius

Frozen meals are stored at -20°C in the UK.

Convert -20°C to degrees Fahrenheit.
Show a check of your working. (3)

Use the box below to show clearly how you get your answer.

Use the box below to show your check.

(Total for Question 9 is 3 marks)

TOTAL FOR PAPER IS 48 MARKS



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