Write your name here

| Surname | | Other names |
|---|---|---|
| | | |

**Pearson Edexcel**
**Functional Skills**

Centre Number

Candidate Number

# Mathematics

## Level 2

5 – 9 January 2015
**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 **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.
- 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 as to how much time to spend on each question.*
- **Where you see this sign 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.**

### Advice

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

*Turn over* ▶

P 4 6 7 9 6 A 0 1 2 0

**PEARSON**

**Answer all questions in this section.**

**Write your answers in the spaces provided.**

**1**   Roy has a woodwork business.

He makes puzzle boxes from plywood.

He buys a rectangular board of plywood with these dimensions.

| Width | 1220 mm |
|-----------|---------|
| Length | 2440 mm |
| Thickness | 6 mm |

Roy needs rectangular pieces 212 mm by 202 mm to make the puzzle boxes.

He thinks he can cut at least 66 pieces from this board of plywood.

(a)  Is Roy correct?
     Show why you think this.                                                **(3)**

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

Roy wants to work out the price he should sell each puzzle box for.

He knows that

- the materials to make 120 puzzle boxes cost £212.24 in total
- the artwork and labour cost £31.60 for each box.

Roy also knows that another business sells similar boxes for £59.80
He decides to sell his boxes for £6 less than the other business.

Roy works out that he will make at least £20 profit on each box.

(b) Does Roy make at least £20 profit on each box?

(5)

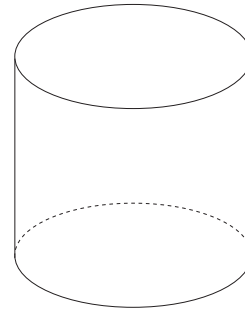Use the box below to show clearly how you get your answer.

Roy also makes wooden flower tubs.
He wants to make a tub to hold 15 litres of compost.

The tub is a cylinder.
The cylinder has a base area of 350 cm$^2$.

Roy knows that

* 1 litre is 1000 cm$^3$
* the volume of a cylinder (cm$^3$) = base area (cm$^2$) × height (cm).

Roy thinks that a tub with a height of 43 cm will hold 15 litres of compost.

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

**(3)**

Use the box below to show clearly how you get your answer.
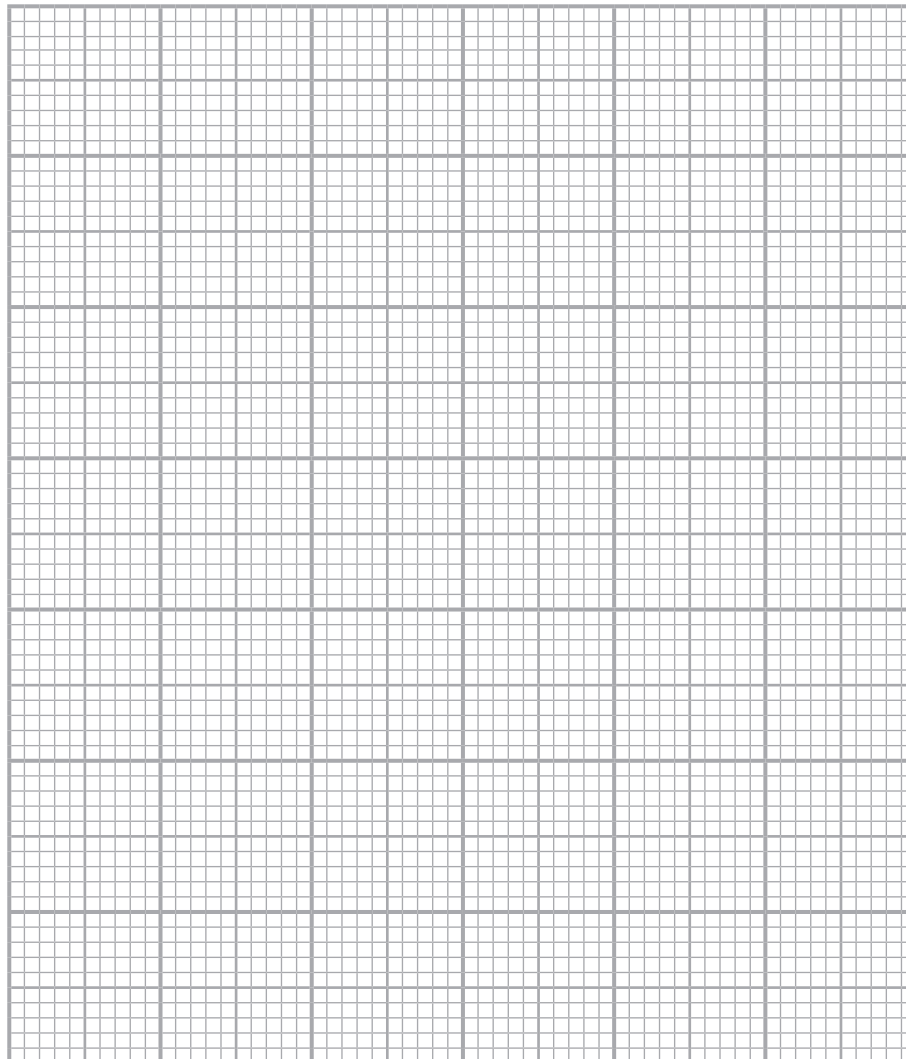
**(Total for Question 1 is 11 marks)**

**2** Roy has this information about the number of orders he had from October to December.

|  | **Oct** | **Nov** | **Dec** |
|---|---|---|---|
| **Puzzle box** | 72 | 106 | 212 |
| **Flower tub** | 150 | 184 | 248 |

He wants to display this information for his business partner in a graph or chart.

(a) Draw a graph or chart for Roy.

(3)

Roy also knows how much profit he made for the last 4 quarters.

| Quarter | Jan – Mar | Apr – Jun | Jul – Sep | Oct – Dec |
|---|---|---|---|---|
| **Profit (£)** | 11 084 | 10 654 | 12 768 | 14 784 |

His business partner wants to know the mean average profit per quarter.

(b) Work out the mean average profit per quarter for Roy.

(2)

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

**(Total for Question 2 is 5 marks)**

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**SECTION B: Charity run**

**Answer all questions in this section.**

**Write your answers in the spaces provided.**

**3**  Katy organises a charity run.
There is going to be a 5 km run and a 10 km run.

Each runner fills in an entry form for the run.
Katy uses the forms to work out how to plan the run.

She needs to collect the following information from the forms.

- entered for the 5 km run or the 10 km run

- male or female

- age category

    – under 30
    – 30 – 50
    – over 50

Katy wants to collect all the information on one sheet of paper.

Design a data collection sheet for Katy.

**(3)**

Use the box below for your data collection sheet.

**4** Katy wants to buy 60 medals for the runners.

She finds this offer.

£0.69 per medal

Get $\frac{1}{3}$ off the total cost

when you order more than 50 medals.

Katy has a budget of £30 for the medals.

(a) Does Katy have enough money to buy all the medals?
Show a check of your answer.
**(4)**

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

Show your check in the box below.

Katy needs to buy some water for the runners.

She wants to buy at least 750 ml of water for each runner.
There are 55 runners.

Katy buys water in 5 litre bottles.
Each bottle costs £1.06

Katy has a budget of £10 for the water.

(b) Does Katy have enough money to buy at least 750 ml of water for each runner?

**(5)**

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

Katy knows that 24 of the 55 runners are taking part in the run for the first time.

She wants to announce this as a percentage in her final speech.

Katy is going to say

34% of the runners are taking part for the first time.

(c) Is Katy correct?
   Show why you think this. **(2)**

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

**(Total for Question 4 is 11 marks)**

**5** Brian buys 15 raffle tickets at the charity run.
585 tickets are sold in total.

There is only one winning ticket.

Brian thinks that the probability he will win is $\frac{1}{40}$

Is Brian correct?
Show why you think this.

**(2)**

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

**(Total for Question 5 is 2 marks)**

P 4 6 7 9 6 A 0 1 3 2 0

**SECTION C: Home improvements**

**Answer all questions in this section.**

**Write your answers in the spaces provided.**

**6** Tamera applies for a home improvement loan.

Her bank gives her this formula to work out the monthly repayment.

$$R = \frac{0.0956\,a}{y}$$

$R$ = monthly repayment (£)

$a$ = amount of loan (£)

$y$ = number of years to repay loan

Tamera wants a loan of £7600
She wants to repay it over 3 years.

Tamera knows her take home pay is £2147 each month.
Her total outgoings are £1850 each month.

Tamera wants to know if she has enough money left each month to afford the monthly repayment.

Can Tamera afford the monthly repayment for this loan?

**(5)**

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

**(Total for Question 6 is 5 marks)**

P 4 6 7 9 6 A 0 1 5 2 0

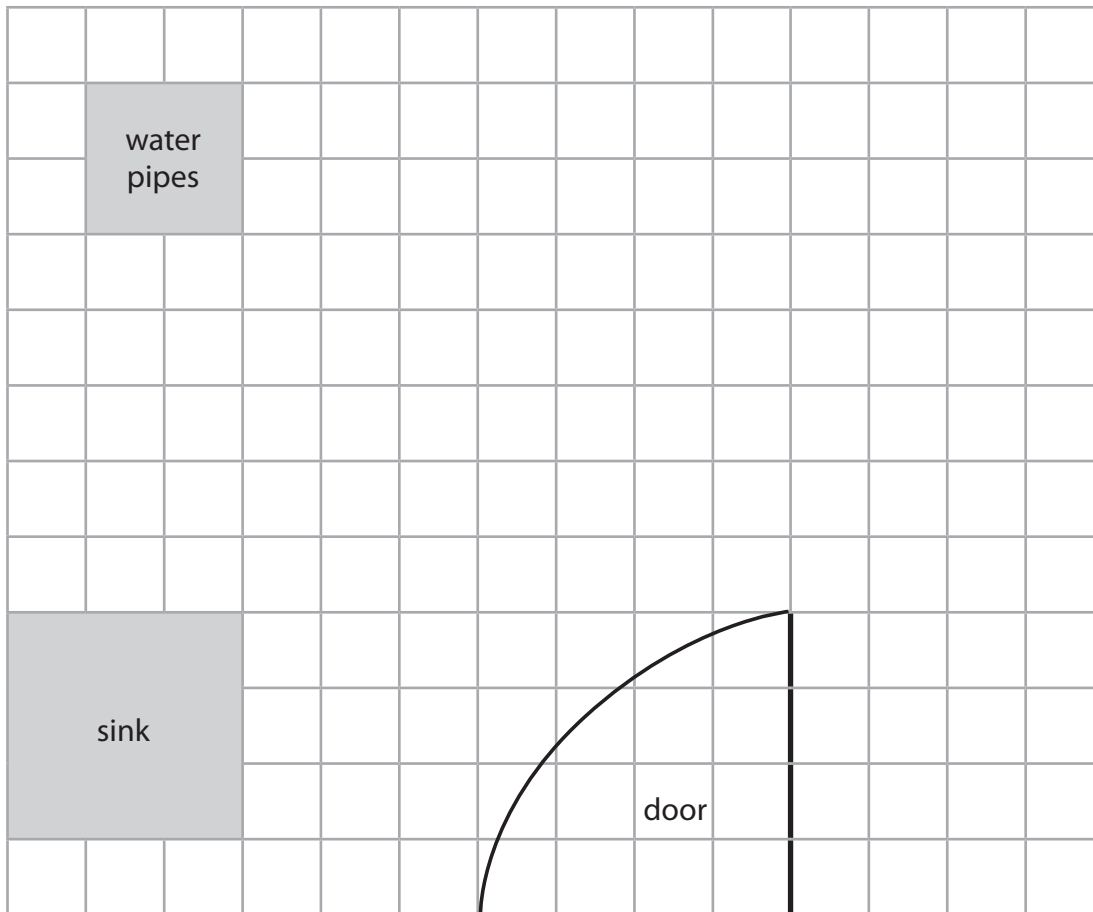**7** Tamera wants to put a new bath in her bathroom.

The bath needs a rectangular space 1625 mm by 750 mm

- over the water pipes
- at least 50 cm from the sink
- at least 100 cm from the door.

Tamera draws a plan of her bathroom.

(a) Draw the space for the new bath on the plan.
Remember to use the key.

**(3)**



Key: 1 square on the plan is 25 cm by 25 cm in the bathroom
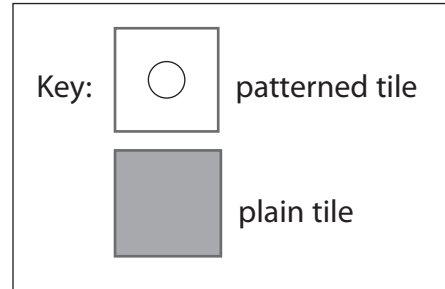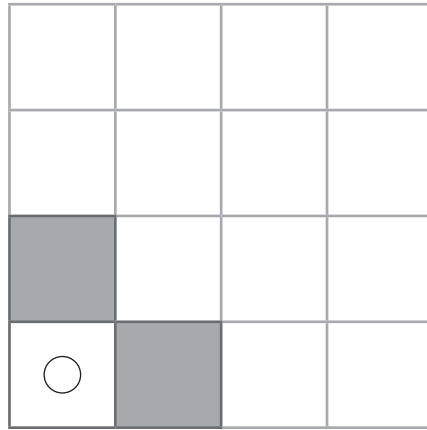
Tamera is going to put tiles on the bathroom wall.

She has 6 patterned tiles and 10 plain tiles.

She wants the tiles to make a symmetrical pattern.

Tamera starts to put the tiles on the wall.



Key:
○ patterned tile

▨ plain tile

(b) Complete the symmetrical pattern with 5 more patterned tiles and 8 more plain tiles.

**(2)**

Draw your pattern on the grid below.
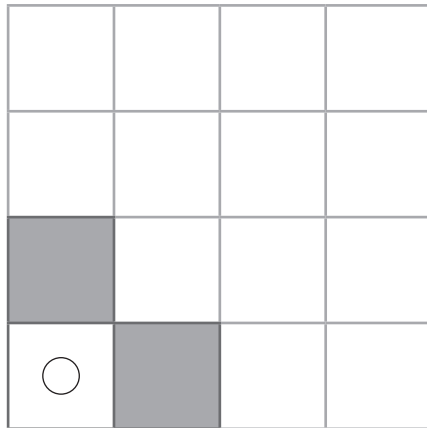
Tamera needs to buy a new extractor fan for her bathroom.
She finds this information.

| extractor fan | price | extraction rate (m³/hour) | noise level dB(A) |
|---|---|---|---|
| A | £144.99 | 220 | 44 |
| B | £209.99 | 460 | 47 |
| C | £79.98 | 241 | 46 |
| D | £74.48 | 110 | 45 |

Tamera has a voucher for 10% off the price of any fan.

Her old extractor fan had

- an extraction rate of 210 m³/hour
- a noise level of 47 dB(A).

Tamera wants the new fan to have a higher extraction rate and a lower noise level.

She wants to use the voucher and pay as little as possible.

(c)  How much will Tamera pay for the extractor fan?

(3)

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

**(Total for Question 7 is 8 marks)**

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**8** Tamera wants to plan work in 2 rooms on Monday.

She estimates that each room needs

- 45 minutes for preparation

- $2\frac{1}{2}$ hours for painting.

She is going to start work at 9 am and she wants to finish by 4 pm.

Can Tamera finish all the work by 4 pm?

**(3)**

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

**(Total for Question 8 is 3 marks)**

**TOTAL FOR PAPER IS 48 MARKS**

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