

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**



16–20 March 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 ►

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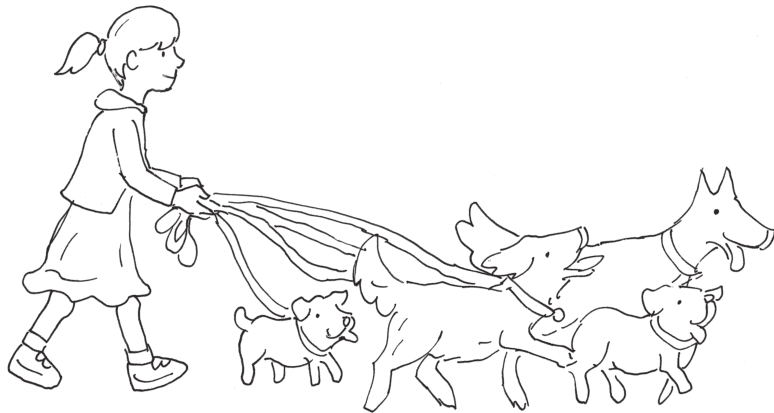
**PEARSON**

**SECTION A: Dogs**

**Answer all questions in this section.**

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

**1** Joan wants to earn money walking dogs.



Joan needs to collect information from the dog owners.

She needs to know

- the name of the owner
- the name of the dog
- the length of walk (30 minutes or 1 hour)
- the day (Mon – Fri).

She wants to collect the information for 5 dogs on one sheet.

Design a data collection sheet for Joan.

(3)

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Use the box below for your data collection sheet.



(Total for Question 1 is 3 marks)

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- 2 Joan uses the money from walking dogs to buy herself a dog. She calls her dog Monty.

She sees this special offer for dog food.

**Doggy Nosh**  
4 kg  
£20.50 per bag  
Buy 2 bags and get 1 free

Joan has £65 to spend on dog food.  
She wants to buy enough food for Monty for 50 days.

Monty needs 264 g of dog food per day.

- (a) Using the special offer, is £65 enough to buy food for Monty for 50 days?  
Show how you have checked your working.

(6)

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



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Show your check in the box below.



Joan knows she should give Monty a total of 264 g of food per day.

She needs to give him some of the food in the morning and some of the food in the evening.

The ratio of food in the morning to food in the evening should be 1 : 2

(b) How much food should Joan give Monty in the evening?

(3)

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



A large empty rectangular box for showing the solution to the problem.

(Total for Question 2 is 9 marks)

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3 Joan takes Monty to the vet.  
She has pet insurance to pay part of the bill.

The vet charges

- £155.71 for treatment
- £73.58 for medicine.

Joan has to pay the first £70 plus 20% of the rest.

She thinks she will have to pay less than £100

Is Joan correct?  
Show why you think this.

(4)

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



A large empty rectangular box for writing the answer.

(Total for Question 3 is 4 marks)

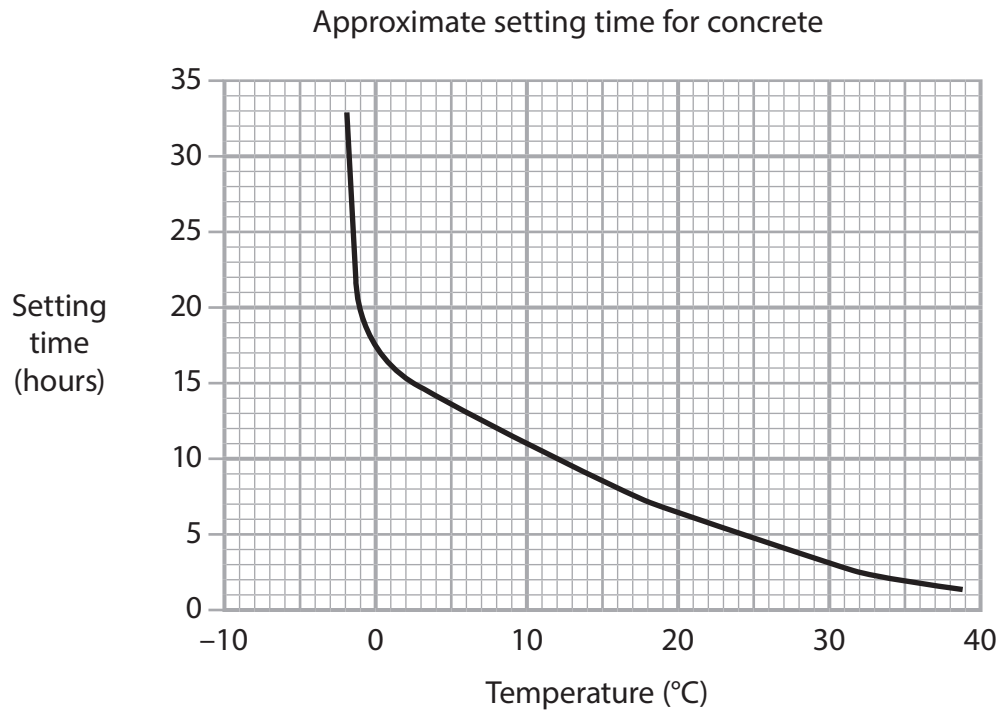


**SECTION B: Concrete**

**Answer all questions in this section.**

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

- 4 Matt works at a concrete plant.  
He has a graph of setting time for concrete at different temperatures.



Matt needs to advise a customer about concrete setting time.  
He uses the graph to explain how the temperature affects the time it takes for concrete to set.

- (a) Write a statement about how temperature affects the time it takes concrete to set.

(1)

Write your statement in the box below.

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The customer wants to lay some concrete.  
Matt finds the weather forecast for the next 2 working weeks on the internet.

March	Mon 17	Tue 18	Wed 19	Thu 20	Fri 21	Mon 24	Tue 25	Wed 26	Thu 27	Fri 28
Expected temperature	6°	-2°	3°	1°	-1°	1°	1°	1°	3°	5°
Probability of rainfall	80%	5%	8%	70%	8%	15%	45%	50%	70%	6%

The customer wants

- the concrete to set in less than 15 hours
- to lay the concrete when the chance of rain is less than 1 in 10

Matt uses the graph and the table to help the customer decide when to lay the concrete.

(b) Which is the best day to lay the concrete?  
How long will it take to set?

(3)

Use the box below for your answer.

(Total for Question 4 is 4 marks)

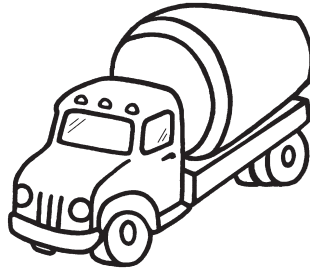


5 Matt has to organise deliveries of concrete to customers.

He loads concrete mixer trucks.

The truck drivers take the concrete to the customers.

Each time a delivery is made, the truck driver goes back and can then take another load.



Matt has 5 concrete mixer trucks.

3 of the trucks can carry  $4 \text{ m}^3$  of concrete each.

2 of the trucks can carry  $6 \text{ m}^3$  of concrete each.

Matt has to organise these jobs for Monday.

Customer	Concrete needed ( $\text{m}^3$ )
Peter – Patio (P)	2
Jackson – Farm (J)	14
Garcia – Garage base (G)	3
Smith – Foundations (S)	11
Mac – Warehouse (M)	10

- Matt is going to load the first truck at 8:00 am.
- It takes 15 minutes to load a truck.
- Matt can only load 1 truck at a time.
- Each truck can only carry concrete for one customer at a time.
- Matt needs to allow 2 hours for the driver to take the concrete to the customer and drive back.
- Matt wants all of the trucks back by 15:00

Matt uses a booking sheet.

He has put the first job (Peter) on the sheet.

Complete the booking sheet for Matt.

(5)

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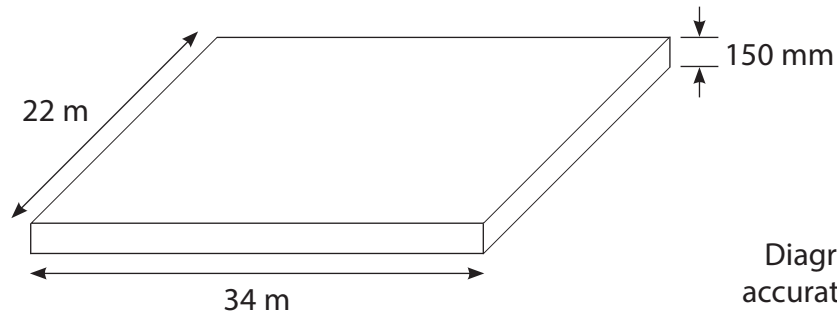
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- 6 Sean is a builder.  
He orders some concrete for a factory floor.

The floor is rectangular 34 m by 22 m.  
Sean wants to lay the concrete to a depth of 150 mm.



Matt knows he needs 350 kg of cement to make 1 m<sup>3</sup> of concrete.

He has 42 tonnes of cement.

Use  
volume = length  $\times$  width  $\times$  depth  
1 tonne = 1000 kg

(a) Is 42 tonnes of cement enough to make the concrete for the floor?

(4)

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



A large empty rectangular box for writing the solution to the problem.

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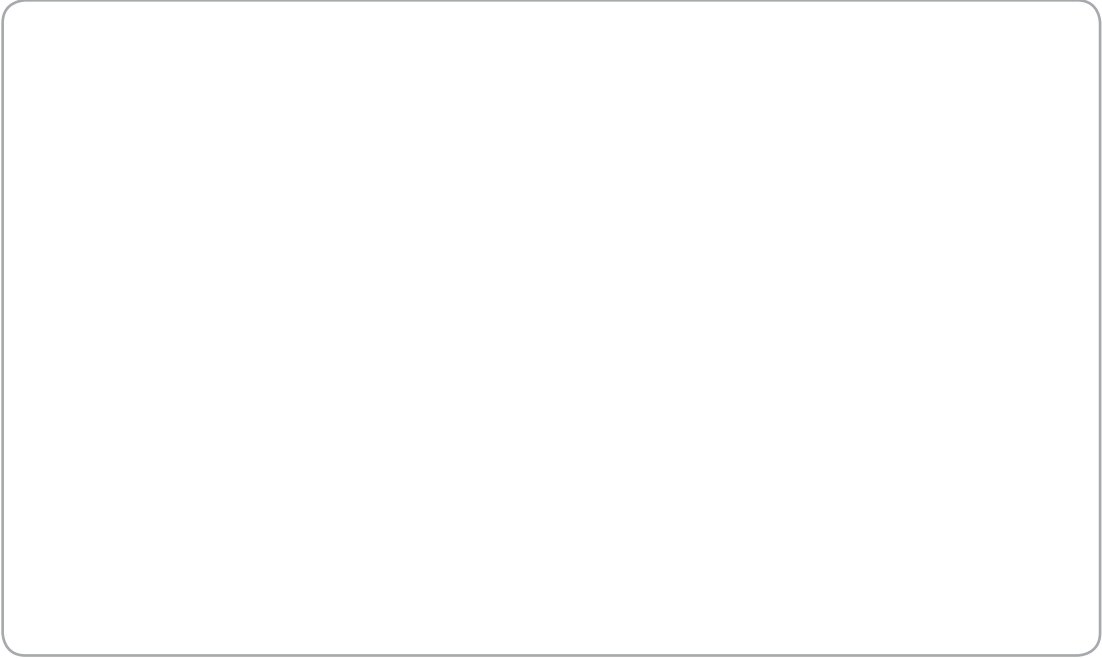
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Sean needs to make a concrete base for a shed.

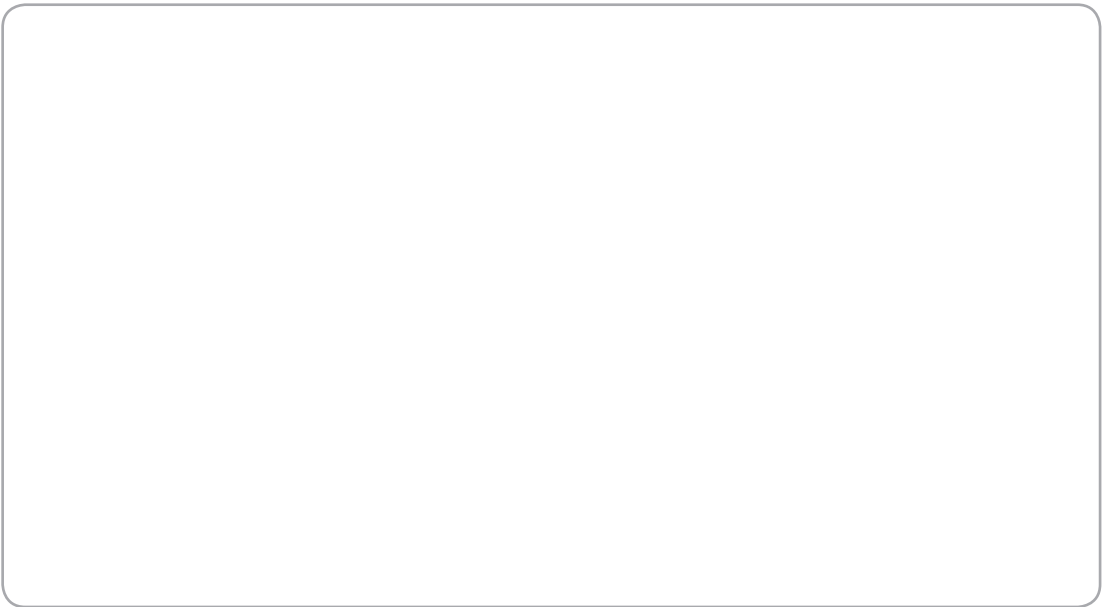
He makes a wooden frame to hold the concrete.  
The frame is rectangular 6.5 m by 3.8 m.

Sean uses pieces of wood 2.4 m long to make the frame.  
The wood can be cut and joined.  
Sean has 8 pieces of wood.

(b) Does Sean have enough pieces of wood to make the frame?

(3)

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



(Total for Question 6 is 7 marks)



**SECTION C: Saving water**

**Answer all questions in this section.**

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

- 7 Dev wants to save money on his water bill.  
He compares the amount he paid for water for the last two years.

<b>2013</b>	£393
<b>2014</b>	£406

Dev tells his family

'Our water bill went up by 5% from 2013 to 2014.'

Is Dev correct?  
Show why you think this.

(3)

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



**(Total for Question 7 is 3 marks)**

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- 8 Dev decides to use rainwater to water the garden.  
He buys a water butt to collect the rainwater.

He uses this formula to work out how many litres it will hold.

$$W = \frac{d^2h}{1275}$$

$W$  = amount of water in litres  
 $d$  = diameter of the water butt in cm  
 $h$  = height of the water butt in cm

The water butt has diameter 52 cm and height 72 cm.  
Dev thinks it will hold at least 120 litres of water.

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

(3)

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



Large empty box for showing the calculation and reasoning.



Dev wants to make a wooden stand for the water butt.  
The stand will be in the shape of a cuboid.  
It will have length 55 cm, width 60 cm and height 50 cm.

- (b) Draw a sketch of the stand  
Label all the dimensions on your sketch.

(2)

Draw your sketch in the box below.



Dev is going to make the top and the sides of the stand from plywood.

He has a rectangular piece of plywood 184 cm by 122 cm.

Dev draws a scale drawing of the plywood on graph paper.

- (c) Show how Dev should cut the top and the sides from the plywood.

(3)

Draw the top and the sides accurately on the scale drawing of the plywood opposite.  
Label the pieces.

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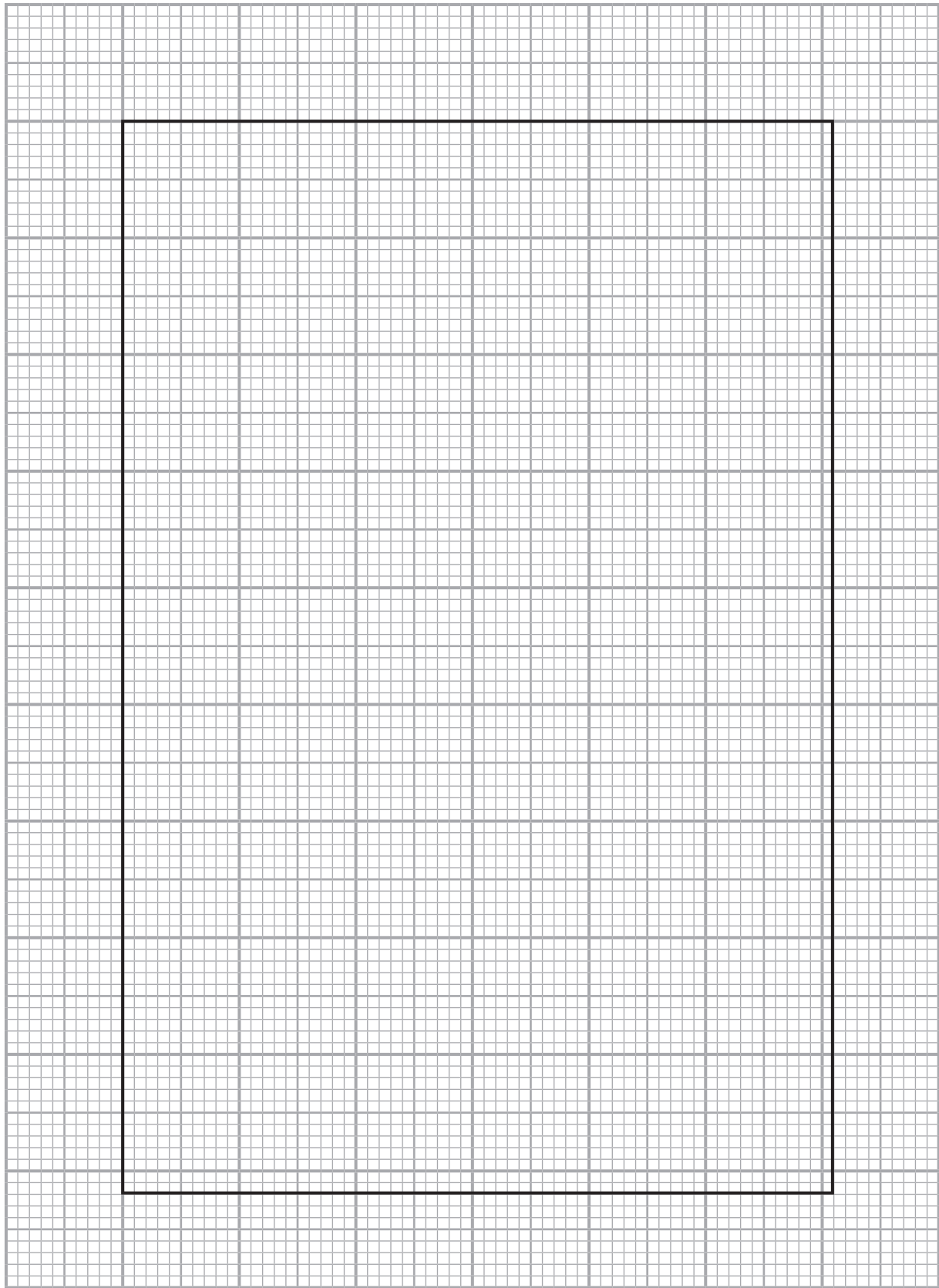
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**(Total for Question 8 is 8 marks)**



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9 The Rhys family also want to save water.  
Last year they used  $81 \text{ m}^3$  of water.

They find out that  $\frac{1}{3}$  of the water used in a household is for toilet flushing.

The toilet uses 9 litres of water per flush.  
They put a Hippo device in the toilet cistern.  
This saves 2 litres of water every time the toilet is flushed.

The Rhys family pay  $\pounds 1.87$  for each  $1 \text{ m}^3$  of water they use.

$1 \text{ m}^3 = 1000$  litres

How much money could the Rhys family have saved if they used the Hippo device last year? (5)

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



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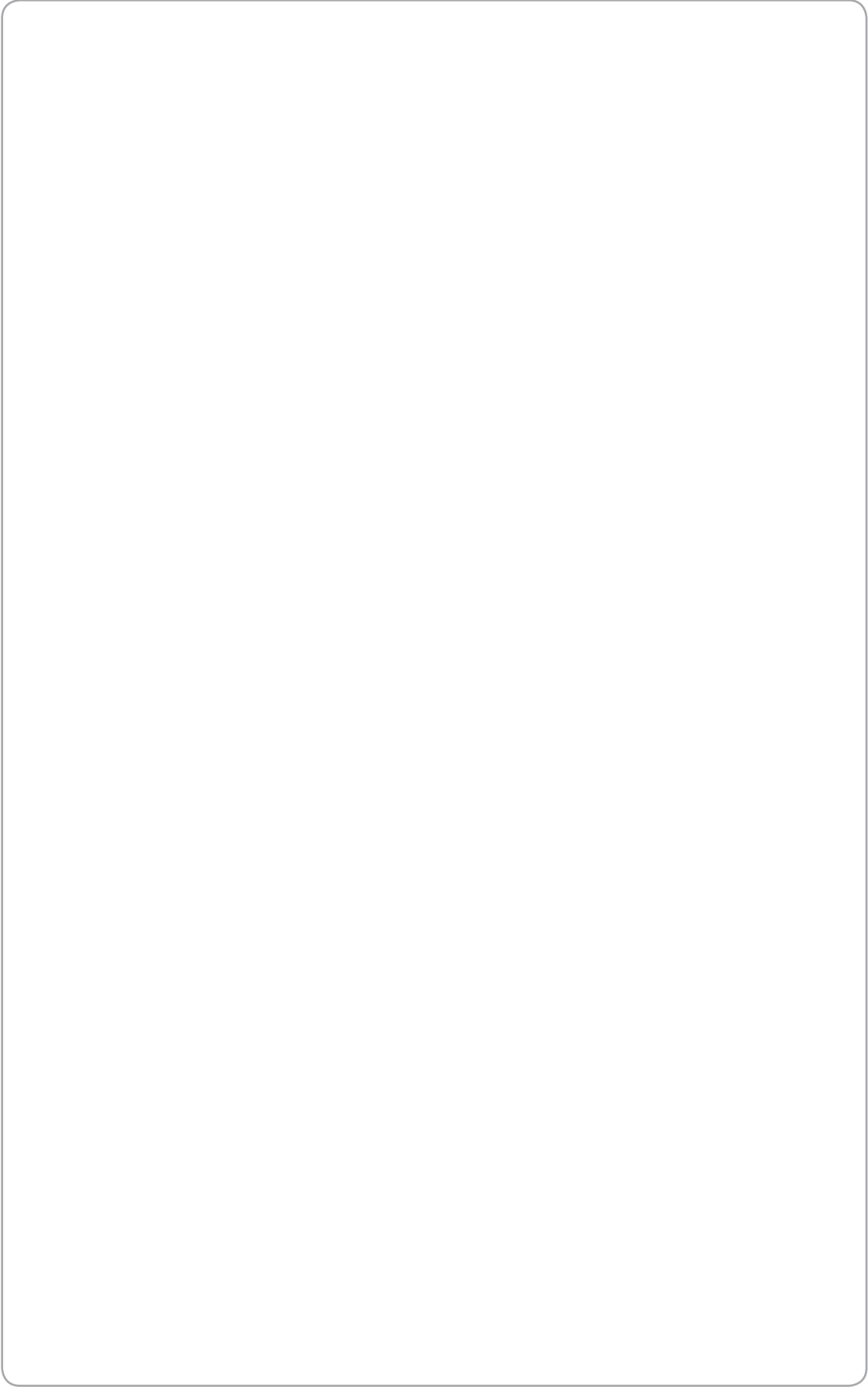
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**(Total for Question 9 is 5 marks)**

**TOTAL FOR PAPER IS 48 MARKS**



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