Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics AO3

Mathematical problem solving

Gold Test 4

Grades 4-5

Time: 30-45 minutes

Paper Reference
1MA1

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

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.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators must not be used in questions marked with an asterisk (*).**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out** with your **answer clearly identified** at the **end of your solution**.

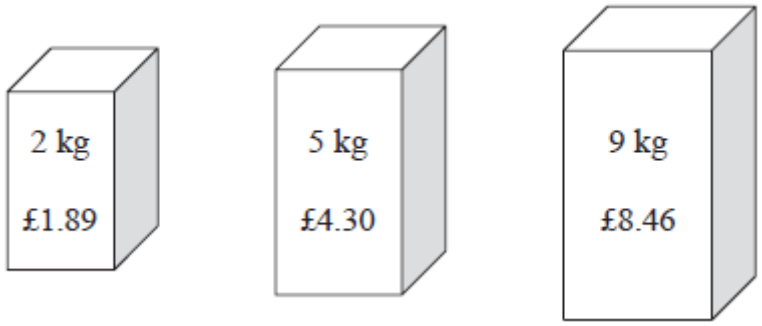
Information

- This gold test is aimed at students targeting grades 4-5.
- This test has 9 questions. The total mark for this paper is 33.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question*.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. Soap powder is sold in three sizes of box.



A 2 kg box of soap powder costs £1.89
A 5 kg box of soap powder costs £4.30
A 9 kg box of soap powder costs £8.46

Which size of box of soap powder is the best value for money?
You must show how you get your answer.

(Total for Question 1 is 3 marks)

***2.** Gary drove from London to Sheffield.
It took him 3 hours at an average speed of 80 km/h.

Lyn drove from London to Sheffield.
She took 5 hours.

Assuming that Lyn
drove along the same roads as Gary
and did not take a break,

(a) work out Lyn's average speed from London to Sheffield.

…….km/h
(3)

(b) If Lyn did **not** drive along the same roads as Gary, explain how this could affect your answer to part (a).

……

……...……

(1)

(Total for Question 2 is 4 marks)

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3. The first three terms of a different Fibonacci sequence are

$$a \quad b \quad a + b$$

Given that the 3rd term is 7 and the 6th term is 29, find the value of a and the value of b.

a = ...

b = ...

(Total for Question 3 is 3 marks)

***4.** One uranium atom has a mass of 3.95×10^{-22} grams.

(a) Work out an estimate for the number of uranium atoms in 1 kg of uranium.

…….……

(3)

(b) Is your answer to (a) an underestimate or an overestimate?
Give a reason for your answer.

……

……

(1)

(Total for Question 4 is 4 marks)

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5. Frank, Mary and Seth shared some sweets in the ratio 4 : 5 : 7
Seth got 18 more sweets than Frank.

Work out the total number of sweets they shared.

……..

(Total for Question 5 is 3 marks)

***6.** There are 1200 students at a school.

Kate is helping to organise a party.
She is going to order a pizza.

Kate takes a sample of 60 of the students at the school.
She asks each student to tell her **one** type of pizza they want.

The table shows information about her results.

Pizza	Number of students
ham	20
salami	15
vegetarian	8
margherita	17

Work out how much ham pizza Kate should order.
Write down any assumption you make **and** explain how this could affect your answer.

……..

……..

(Total for Question 6 is 3 marks)

7. Henry is thinking of having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter

A charge of £28.20 per year

plus

91.22p for every cubic metre of water used

1 cubic metre = 1000 litres

No Water Meter

A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Use this information to determine whether or not Henry should have a water meter.

(Total for Question 7 is 5 marks)

8. There are 25 boys and 32 girls in a club.

$\frac{2}{5}$ of the boys and $\frac{1}{2}$ of the girls walk to the club.

The club leader picks at random a child from the children who walk to the club.

Work out the probability that this child is a boy.

.....

(Total for Question 8 is 3 marks)

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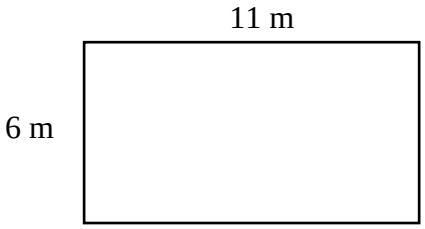
9. A tin of varnish costs £15

A rectangular floor has dimensions 6 m by 11 m.
The floor is going to be covered in varnish.



Helen assumes that each tin of this varnish covers an area of 12 m^2.

(a) Using Helen's assumption, work out the cost of buying the varnish for this floor.

£……..

(4)

Helen finds that each tin of varnish covers less than 12 m^2.

(b) Explain how this might affect the number of tins she needs to buy.

……..

……...

(1)

(Total for Question 9 is 5 marks)

TOTAL FOR PAPER IS 33 MARKS

Mathematical problem solving: Gold Test Grades 4-5			
Question	**Working**	**Answer**	**Notes**
1	£ per kg: 1.89 ÷ 2 = 0.945 (94.5); 4.30 ÷ 5 = 0.86 (86); 8.46 ÷ 9 = 0.94 (94) kg per £: 2 ÷ 1.89 = 1.058(2…) ; 5 ÷ 4.30 = 1.162(79…); 9 ÷ 8.46 = 1.0638(297…) Price per 90 kg: 1.89 × 45 = 85.05; 4.30 × 18 = 77.4(0); 8.46 × 10 = 84.6(0)	5 kg (supported)	P1 for a process (for at least two boxes) of division of price by quantity or division of quantity by price or a complete method to find price of same quantity or to find quantity of same price P1 for a complete process to give values that can be used for comparison of all 3 boxes C1 for 5 kg and correct values that can be used for comparison for all 3 boxes and a comparison of their values
2 (a)		48	P1 start to process eg. 3 × 80 (= 240) P1 '240' ÷ 5 A1
(b)			C1 e.g. she may drive a different distance and therefore her average speed could be different
3	$3a + 5b = 29$ $a + b = 7$ $3a + 3b = 21$ $b = 4$, $a = 3$	$a = 3$ $b = 4$	P1 Process to set up two equations P1 Process to solve equations A1

Mathematical problem solving: Gold Test Grades 4-5			
Question	**Working**	**Answer**	**Notes**
4 (a)		2.5×10^{24}	P1 process to estimate or divide P1 a complete process eg. $(1 \times 10^{3}) \div (4 \times 10^{-22})$ A1
(b)		Underestimate	C1 ft from (a) e.g. under estimate as number rounded up but in denominator of fraction
5		96	P1 a strategy to start to solve the problem eg. $18 \div (7 - 4)$ (= 6) P1 for completing the process of solution eg. "6" × (4 + 5 + 7) A1 cao
6		400	P1 Start to process e.g. 1200 ÷ 60 A1 400 oe (accept number of whole pizzas e.g. 400÷4 = 100 with 4 people per pizza) C1 E.g. Assumption that sample is representative of population – it may not be all 1200 people are going to the party – need less pizza if they don't, assume 4 people per pizza – if different may need more/fewer pizzas

Mathematical problem solving: Gold Test Grades 4-5			
Question	**Working**	**Answer**	**Notes**
7		Have a water meter (from working with correct figures)	P1 Process to find number of litres, e.g. 180 ÷ 1000 P1 Full process to find cost per day P1 Full process to find total cost of water used per year (accept use of alternative time period for both options) P1 Full process with consistent units for total cost of water A1 Correct decision from correct figures (88.13154 or correct figure for their time period)
8	25÷ 5 × 2 = 10 32 ÷ 2 = 16 $\frac{10}{10+16}$	$\frac{10}{26}$	P1 Process to find number of boys walking and number of girls walking Complete process to find probability P1 $\frac{10}{26}$ oe A1
9 (a)		90	P1 for the process of finding an area eg. 6×11 (= 66) P1 (dep on area calculation) for the process of working out the number of tins, eg. "66" ÷ 12 (=5.5 or 6 tins) P1 for the process of working out the cost eg. "6" tins × £15 A1 cao
(b)		reason	C1 she might need to buy more tins