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

Centre Number

Candidate Number

Mathematics AO3
Mathematical problem solving

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 6 questions. The total mark for this paper is 27.
- 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. There are 3 red beads and 1 blue bead in a jar.
A bead is taken at random from the jar.

(*a*) What is the probability that the bead is blue?

(1)

There are 4 yellow counters and 3 green counters in a bag.

Sharon puts some more green counters into the bag.
The ratio of the number of yellow counters to the number of green counters is now 2 : 5.

(*b*) How many green counters did Sharon put into the bag?

(2)

(Total for Question 1 is 3 marks)

2. *A* has coordinates (40, 60).
B has coordinates (0, 20).

A straight line passes through the points *A* and *B*.

The point *P* lies on this straight line.

The *x*-coordinate of *P* is 0.5.

(*a*) Find the *y*-coordinate of *P*.
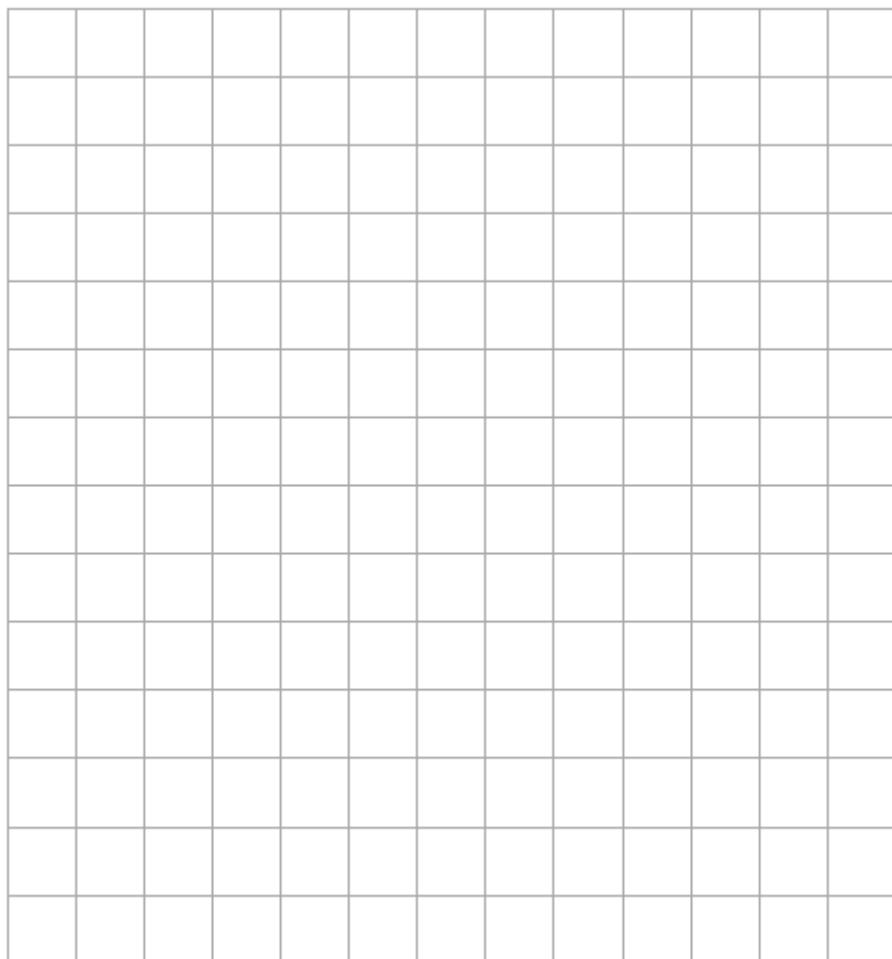
(3)

(*b*) Is your answer to part (*a*) reliable?
Explain your answer.

(1)

(Total for Question 2 is 4 marks)

3. Mr and Mrs Sharma are going to France.

They each have £300 which they want to change into euros.
They see this deal in a bank.

Great Rates

Get 1.04 euros for £1 on amounts less than £500

Get 1.12 euros for £1 when you change £500 or more
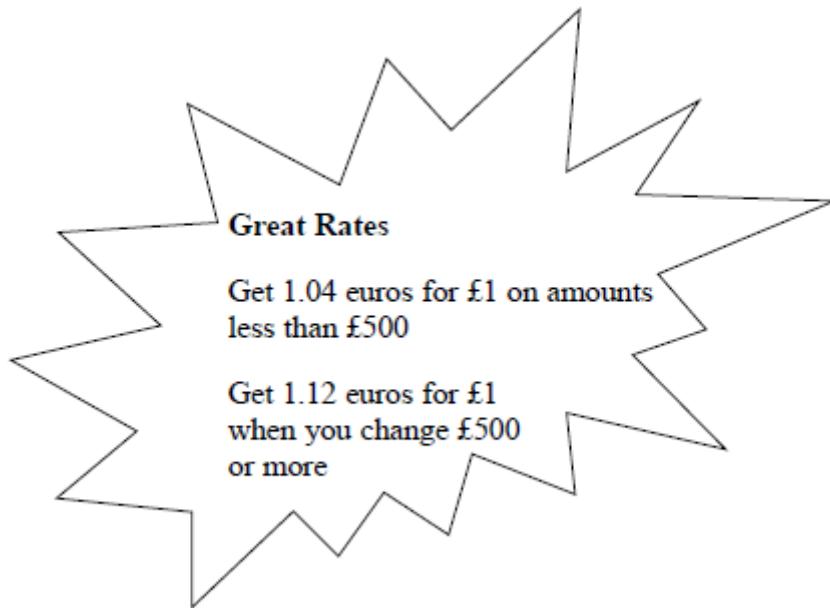
Mr and Mrs Sharma want the best deal.

They put their money together before changing it into euros.

How much extra money do they get by putting their money together before they change it?

(Total for Question 3 is 3 marks)

4. Jane made some almond biscuits which she sold at a fête.

She had:

    5 kg of flour
    3 kg of butter
    2.5 kg of icing sugar
    320 g of almonds

Here is the list of ingredients for making 24 almond biscuits.

```
Ingredients for 24 almond biscuits
        150 g flour
        100 g butter
         75 g icing sugar
         10 g almonds
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Jane made as many almond biscuits as she could, using the ingredients she had.

(*a*) Work out how many almond biscuits she made.

(3)

Jane sold 70% of the biscuits she made for 25p each.
She sold the other 30% at 4 for 55p.

The ingredients Jane used cost her £45 and the total of all other costs was £27.

(*b*) Work out the percentage profit.

(6)

(Total for Question 4 is 9 marks)

5

5. Ashten chooses three different whole numbers between 1 and 50.

The first number is a prime number.
The second number is 4 times the first number.
The third number is 6 less than the second number.

The sum of the three numbers is greater than 57.

Find the three numbers.

(Total for Question 5 is 3 marks)

6. Linda keeps chickens.
She sells the eggs that her chickens lay.

She has 140 chickens.
Each chicken lays 6 eggs a week.

Linda gives each chicken 100 g of chicken feed each day.
The chicken feed costs £6.75 for a 25 kg bag.

Work out the cost of the chicken feed for every 12 eggs.

(Total for Question 6 is 5 marks)

TOTAL FOR PAPER IS 33 MARKS

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Question		Working	Answer	Mark	AO	Notes
*1	(a)		$\dfrac{1}{4}$	B	1.2	B1 for $\dfrac{1}{4}$ oe
	(b)		7	P	3.1c	P1 for process to start to solve problem, e.g. $2:5 = 4:10$
				A	1.3a	A1 cao
2	(a)		20.5	P	3.1b	P1 for a correct start to a correct process to identify the required straight line, e.g. a sketch showing points (40, 60) and (0, 20) joined with a line segment or a correct process to find the gradient of a line between the two points, e.g. $\dfrac{60-20}{40-0}$ (=1)
				P	3.1b	P1 for a correct process using scale factors, e.g. showing two similar triangles with the line crossing the x-axis or for a correct process using $y = mx + c$ to find the value of c (= 20) or $y = x + 20$
				A	1.3b	A1 for 20.5
	(b)		decision and explanation	C	3.4b	C1 for a decision on the reliability of their answer to part (a) with valid explanation eg no I have drawn a line on he grid and my line may not be accurate(need both the decision and an explanation to gain the mark)

Question	Working	Answer	Mark	AO	Notes
3		€48 or £42.86	P	3.1c	P1 for a correct process, using the lower rate, to find the amount by changing their money separately, e.g. 300 × 1.04 × 2 (= 624)
			P	3.1c	P1 for a correct process, using the higher rate, to find the amount by changing their money together, e.g. 300 × 2 × 1.12 (= 672) resulting in two values to compare
			A	1.3a	A1 for 48 euros or £42.85 or £42.86 if converted to sterling, units must be clear
4 (a)		720	P	3.1c	P1 attempt to find the maximum biscuits for one of the ingredients, e.g. 5000 ÷ 150 (= 33.3..) or 2500 ÷ 75 (= 33.3…) or 3000 ÷ 100 (= 30) or 320 ÷ 10 (= 32)
			P	3.3	P1 for identifying butter as the limiting factor or 30 × 24 (= 720) seen
			A	1.3b	A1 for 720 cao
(b)		116.25%	M	1.3b	M1 for a correct method of finding either 70% (= 504) or 30% (= 216) of 720
			P	3.1b	P1 for a process to find the cost of "216" at 55p for 4 (= £29.70)
			P	3.1b	P1 for a process to find revenue, e.g. "504" × £0.25 + "£29.70" (= £155.70)
			P	3.1b	P1 for a process to find profit, e.g. "£155.70" – £45 – £27
			M	1.3b	(= £83.70)
			A	1.3b	M1 for $\dfrac{'83.70'}{72} \times 100$ A1 for 116.25%

Question	Working	Answer	Mark	AO	Notes
5	7 + 28 + 22 = 57	11, 44 and 38	P	3.1b	P1 for a correct process to develop algebraic expressions for each number and set up an inequality, e.g. x + 4x + 4x − 6 > 57 or for a correct trial with a prime number
			P	3.1b	P1 for a correct process to solve the inequality, e.g. x > (57 + 6) ÷ 9 (= 7) or for a correct trial with the prime number as 7 resulting in a sum of 57
			A	1.3b	A1 cao
6		38p	P	3.1d	P1 for a correct first step, e.g. 140 × 6 (= 840 eggs per week)
			P	3.1d	P1 for a correct process to find the weight of feed per week, e.g. 100 × 140 × 7 (= 98000g or 98 kg)
			P	3.1d	P1 for a correct method to find the weekly cost, e.g. 6.75 ÷ 25 × "98" (= £26.46)
			P	3.1d	P1 for completing the process to find the cost of feed required for 12 eggs, e.g. (2646 ÷ 840) × 12 = 37.8p
			A	1.3b	A1 for 37.8p or 38p oe