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

Grades 1-3

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 as 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 1-3.
- This test has 7 questions. The total mark for this paper is 26.
- 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.** Shazia buys 10 boxes of drinks.

The cost of each box of drinks is £5.
Each box holds 12 cans of drink.

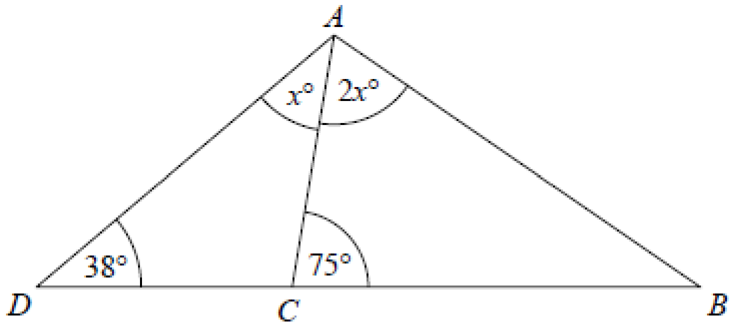
Shazia sells $\frac{2}{3}$ of the total number of cans for 60p each.

She then sells all the remaining cans for 30p each.

Work out the total profit that Shazia makes.

(Total for Question 1 is 5 marks)

2.

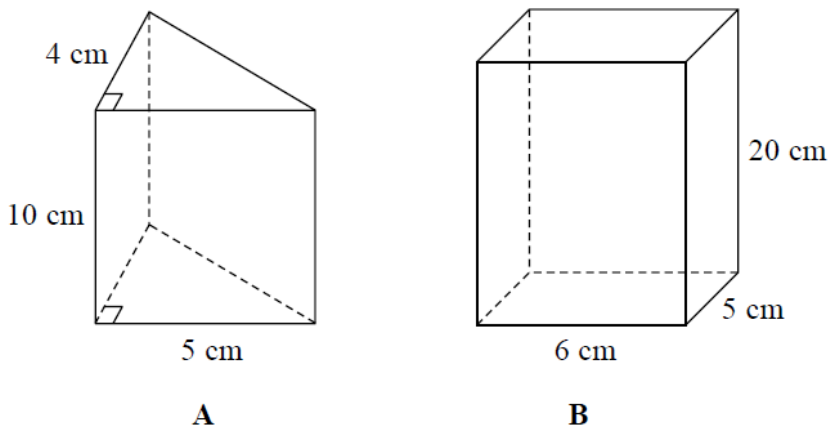


ABD is a triangle.
C is a point on *BD*.

Show that angle *ABD* is 31°.
Give a reason for each stage in your working.

(Total for Question 2 is 4 marks)

***3.** The diagram shows a right-angled triangular prism **A** and a cuboid **B**.



Show that the volume of **B** is 6 times the volume of **A**.

(Total for Question 3 is 3 marks)

***4.** Carpet tiles are going to be used to cover a floor.

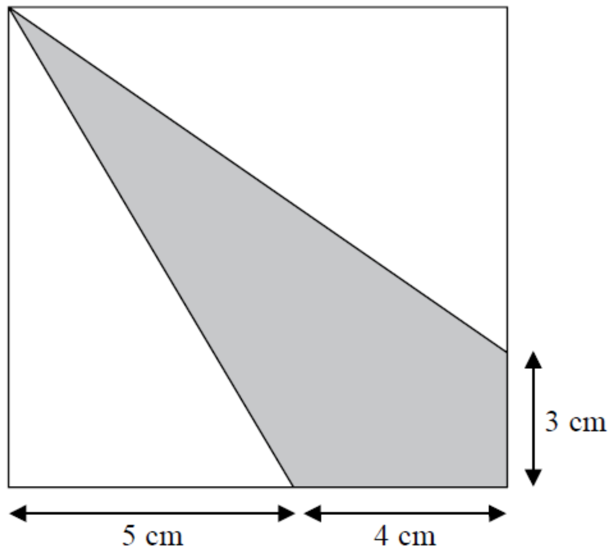
The floor is a 1200 mm by 1000 mm rectangle.
Each carpet tile is a 40 cm by 30 cm rectangle.

Exactly 10 carpet tiles can be used to cover the floor completely.

Show in a labelled sketch how this can be done.

(Total for Question 4 is 3 marks)

***5.** The diagram shows a shaded quadrilateral inside a square.

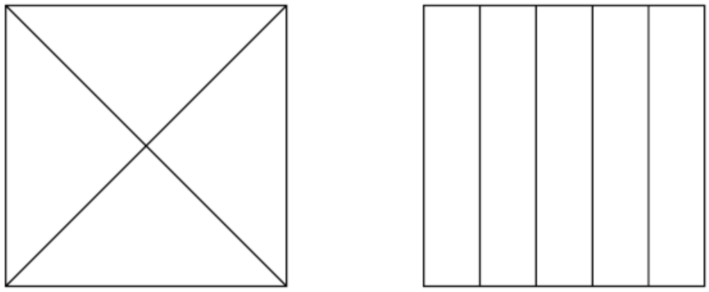


Work out the area of the shaded quadrilateral.

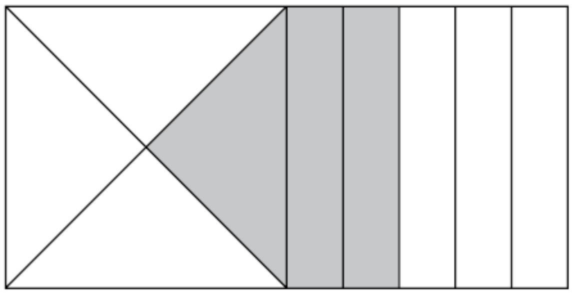
(Total for Question 5 is 4 marks)

***6.** Here are two identical squares.

The first square is divided into four equal parts.
The second square is divided into five equal parts.



The two squares are joined together as shown to make a rectangle.



What fraction of the rectangle is shaded?

(Total for Question 6 is 3 marks)

7. Noah buys coffee sachets to use in his coffee maker.

There are 16 coffee sachets in a pack.

A pack costs £3.99.

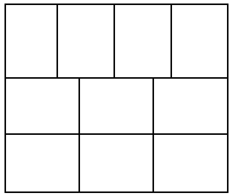
Noah uses 5 coffee sachets each day.

Work out the minimum amount that Noah spends on coffee sachets in one year.

(Total for Question 7 is 4 marks)

TOTAL FOR PAPER IS 26 MARKS

Question	Working	Answer	Mark	AO	Notes
*1	Cost price is £50 Total number is 120 $\frac{2}{3} \times 120 = 80$ Income from these is 60p × 80 = £48 Income from the remainder is 30p × 40 = £12 Profit = £48 + £12 – £50	£10	P P P P A	3.1d 3.1d 3.1d 3.1d 1.3b	P1 for a process to find the total cost of 10 boxes of drink and the total number of cans bought, e.g. 10 × 5 (=50) and 10 × 12 (=120) P1 for a process to find the number of cans sold for 60p, e.g. $\frac{2}{3} \times '120'$ (= 80) oe P1 for a process to find the cost of cans sold for 60p e.g. ‘80’ × 60p (= £48) oe P1 for a process to find the cost of their remaining cans at 30p each, e.g. (120 – '40') × 30p oe A1 cao
2		show	P P P C	2.2 2.2 2.2 1.1	P1 for a correct start to the chain of reasoning, e.g. find angle *CAB* P1 for a correct process to find angle *CAB* P1 for completion of chain of reasoning with at least one appropriate reason C1 for all other reasons
*3		Show	M P C	1.1 2.2 2.2	M1 for Use of correct formula for volume for triangular prism or cuboid, e.g. $\frac{1}{2} \times 4 \times 10 \times 5 (= 100)$ or 6 × 20 × 5(= 600) P1 for beginning to construct chains of reasoning, e.g. $\frac{1}{2} \times 4 \times 10 \times 5 (= 100)$ and 6 × 20 × 5 (= 600) C1 for completion of chains of reasoning, e.g. 600 ÷ 100 = 6

Question	Working	Answer	Mark	AO	Notes
*4	1200 ÷ 300 = 4 1200 ÷ 400 = 3 1000 = 400 + 300 + 300	Correct diagram with correct layout 	M P C	1.1 2.3a 2.3b	M1 for changing to consistent units, e.g. 1000 ÷ 10 or 40 × 10 P1 for interpreting information and a process to fit tiles in floor area, e.g. may be seen on a sketch or may see a calculation C1 for diagram to communicate a correct layout with lengths clearly identified
*5	Square 9 × 9 =81 Bottom triangle $\frac{5\times9}{2}=\frac{45}{2}$ Top triangle $\frac{6\times9}{2}=\frac{54}{2}$ Shaded area 81 − 22.5 – 27	31.5 cm^2	P P P	3.1b 3.1b 3.1b	P1 for a process to establish the missing lengths on the perimeter of the shape P1 for a process to begin the problem by finding the area of one relevant shape P1 for complete process to find the shaded area, e.g. 9 × 9 – ('22.5' + '27')
*6		$\frac{13}{40}$	P P A	2.3a 3.1a 1.3a	P1 for interpreting diagrams eg. writing the area of the triangle section of the square as a quarter or writing the rectangular section as a fraction of the area of the square as two fifths P1 for correct processes needed to solve problem, e.g. $\frac{1}{4}+\frac{2}{5}=\frac{1\times5+2\times4}{4\times5}\left(=\frac{13}{20}\right)$ **and** $\frac{1}{2}\times'\frac{13}{20}'$ A1 for $\frac{13}{40}$ oe

Question	Working	Answer	Mark	AO	Notes
7		£458.85 or £454.86	P	3.1d	P1 for a correct process to find number of sachets used in a year, e.g. 5 × 365 (= 1825) or 5 × 366 (= 1830)
			P	3.1d	P1 for a correct process to find the number of packs required, e.g. "1825" ÷ 16 (= 114 or 115) or "1830" ÷ 16 (= 114 or 115)
			P	3.1d	P1 for recognising the need to round up or down to ensure a whole number value £3.99 × 115 (or 114)
			A	1.3b	A1 for £458.85 or £454.86