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## GCSE

4351/01


S16-4351-01

# MATHEMATICS (UNITISED SCHEME) <br> UNIT 1: Mathematics in Everyday Life FOUNDATION TIER 

## A.M. THURSDAY, 26 May 2016

1 hour 15 minutes

## ADDITIONAL MATERIALS

A calculator will be required for this paper.
A ruler, a protractor and a pair of compasses may be required.

## INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.
Write your name, centre number and candidate number in the spaces at the top of this page.
Answer all the questions in the spaces provided.
If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.
Take $\pi$ as $3 \cdot 14$ or use the $\pi$ button on your calculator.

## INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.
Unless stated, diagrams are not drawn to scale.
Scale drawing solutions will not be acceptable where you are asked to calculate.

| For Examiner's use only |  |  |
| :---: | :---: | :---: |
| Question | Maximum <br> Mark | Mark <br> Awarded |
| 1. | 6 |  |
| 2. | 7 |  |
| 3. | 5 |  |
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| 8. | 9 |  |
| 9. | 5 |  |
| 10. | 3 |  |
| 11. | 4 |  |
| 12. | 2 |  |
| 13. | 3 |  |
| 14. | 3 |  |
| Total | 65 |  |

The number of marks is given in brackets at the end of each question or part-question.
You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 4.


## Formula List

Area of trapezium $=\frac{1}{2}(a+b) h$


Volume of prism $=$ area of cross-section $\times$ length


1. A builder uses the following formula when preparing a bill for his customers.

Total cost $=£ 15 \times$ number of hours worked + cost of materials
(a) Calculate the total cost when he worked for $7 \frac{1}{2}$ hours and the cost of materials used was £107.50.
(b) The customer paid $25 \%$ of the total cost using cash. The customer paid the rest of the total cost by credit card.
(i) How much money did the customer pay using cash?
(ii) What fraction of the total cost did the customer pay using cash?
(c) The builder started work on the $7 \frac{1}{2}$ hour job at 08:00.

He had 1 hour off for lunch.
At what time did he finish this job?
2. A community cafe was set up to support a local charity.

Over the summer, 40 volunteers helped out at the cafe.
The number of days for which each volunteer helped out is shown below.

| 28 | 15 | 1 | 42 | 3 | 10 | 8 | 30 | 1 | 32 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 35 | 52 | 9 | 1 | 19 | 35 | 12 | 5 | 25 | 30 |
| 13 | 5 | 32 | 10 | 3 | 50 | 20 | 3 | 12 | 11 |
| 3 | 30 | 4 | 20 | 1 | 22 | 15 | 10 | 5 | 18 |

(a) A table is drawn to show this information. Complete this table.

| Number of days | Tally | Number of <br> volunteers |
| :---: | :---: | :---: |
| Up to 9 | H+H H/+ //// | 14 |
| 10 to 19 |  |  |
| 20 to 29 |  |  |
| 30 or more |  |  |

(b) Using the squared paper on the next page, draw a suitable bar chart that shows this information.

3. Susan checks her water-meter reading every Monday morning. Five readings taken during August 2015 are shown below.

| Date | $3^{\text {rd }}$ August | $10^{\text {th }}$ August | $17^{\text {th }}$ August | $24^{\text {th }}$ August | $31^{\text {st }}$ August |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Meter reading <br> $\left(\mathrm{m}^{3}\right)$ | $76 \cdot 5$ | $80 \cdot 7$ | $84 \cdot 6$ | $94 \cdot 8$ | $98 \cdot 9$ |

(a) How much water was used between the $3^{\text {rd }}$ of August and the $31^{\text {st }}$ of August?

Water used = $\qquad$ $\mathrm{m}^{3}$
(b) How many weeks are there between the $3^{\text {rd }}$ of August and the $31^{\text {st }}$ of August?
(c) Calculate the mean amount of water that was used per week over this period of time.
(d) On one day during this month, Susan left a garden sprinkler on all day which used $4.5 \mathrm{~m}^{3}$ of water. Write down a possible date on which this could have happened.

Date $\qquad$
4. You will be assessed on the quality of your written communication in this question.

A shop sells oranges in packs of 8 at a price of $£ 1.44$.
A special offer is advertised as two packs for $£ 2.40$.
Emyr bought two packs using the special offer.
Emyr had to throw away $\frac{1}{4}$ of the oranges he bought because they became mouldy before he had time to eat them.

Calculate the price per orange
(i) when buying a single pack,
(ii) when buying two packs at the special offer,
(iii) for the oranges that Emyr actually used.

Comment on whether Emyr was wise to use the special offer.
You must show all your working.
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5. Three points $A, B$ and $C$ are to be shown on a plan whose scale is

$$
1 \text { centimetre represents } 20 \text { metres. }
$$

Point $A$ and point $B$ are already shown on the plan below. Point $C$ is further North than point $B$.

Angle $A B C$ is $75^{\circ}$ and the actual distance $B C$ is 180 metres.
(a) Show where point $C$ should be on the plan.

A.
(b) What is the actual distance between point $A$ and point $C$ ?
${ }^{\bullet} B$

Actual distance between point $A$ and point $C=$ $\qquad$
6. Complete the table below which shows the change in the midday temperatures on two successive days at four locations.
The first row has been done for you.

| Location | Temperature at <br> midday on the <br> first day $\left({ }^{\circ} \mathrm{C}\right)$ | Change ( $\left.{ }^{\circ} \mathrm{C}\right)$ | Temperature at <br> midday on the <br> following day $\left({ }^{\circ} \mathrm{C}\right)$ |
| :---: | :---: | :---: | :---: |
| Holyhead | -2 | Up 3 | 1 |
| Paris | 4 |  | -1 |
| Helsinki | -5 | Down 2 |  |
| Glasgow |  | Up 1 | 0 |

7. Given that

- 1 litre is approximately 1.75 pints,
- 1 gallon $=8$ pints,
calculate the approximate number of gallons that are equal to $16000 \mathrm{~cm}^{3}$.
$\qquad$

8. Builders use cement and sand to make mortar when building walls.

They estimate how much material they need to order before they start to work.
One useful estimation they use is shown below.

For every $1 \mathrm{~m}^{2}$ of wall: cement required $=15.5 \mathrm{~kg}$, sand required $=56 \mathrm{~kg}$.

Hasan is building a wall 25 metres long and 2 metres high.
He buys cement in 25 kg bags costing $£ 4.87$ per bag. He buys sand in 40 kg bags costing $£ 2.65$ per bag.

Calculate the total cost of the cement and sand required.
You must show all your working.
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9. Dylan is going on a trip to Japan.

The exchange rate at the time of his trip is $£ 1 \equiv 175$ yen.
(a) Draw a conversion graph between $£$ and yen on the graph paper below. The graph should show the conversion from $£ 0$ to $£ 50$.
(b) Use your graph, or otherwise, to convert 20000 yen into pounds. Give your answer correct to the nearest pound.
10. (a) Explain why the following statement and diagrams may give a misleading impression. Include an example to show how this could happen.
'Porws School celebrates, as percentage pass rate doubles, but no increase at Gorry School.'


(b) Explain why the statement beneath the following pie charts may not be true.

'There are more female councillors on Westbridge council than on Eastbridge Council.'
11. Orienteering is a competition that involves running and using a compass to find directions. It is usually held in wooded and hilly areas of the country. Liam and Krysta are competing in an orienteering event.

Liam starts from point $A$ and Krysta starts from point $B$.
They are only given the finish point $P$ of the race once they are at their starting positions.
Liam is told that point $P$ is on a bearing of $108^{\circ}$ from point $A$.
Krysta is told that point $P$ is on a bearing of $230^{\circ}$ from point $B$.
(a) By drawing suitable lines, mark the position of point $P$ on the diagram below.
(b) When training together, Liam and Krysta have the same running speed. Neither of them stopped during the race. Both went as fast as they could and there were no injuries.
Both started at the same time.
Give a possible reason why the person who started furthest away from point $P$ got there first.
12. Calculate $\frac{854 \cdot 7}{(43 \cdot 2-37 \cdot 6)^{3}}$, giving your answer correct to 3 significant figures.
$\qquad$
$\qquad$
13. A baker requires 825 kg of flour.

She buys the flour in bags that contain 36 kg of flour, correct to the nearest kg .
Is she guaranteed to have enough flour if she buys 23 of these bags?
You must show the calculations needed to decide your answer.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
14. In a game, it is possible for each player to score between 1 and 10 points. Lois and Beca play the game five times.

The table below shows the points scored by Lois in each game.

|  | Game 1 | Game 2 | Game 3 | Game 4 | Game 5 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Lois | 5 | 2 | 8 | 5 | 1 |
| Beca |  |  |  |  |  |

Beca had a higher mean score than Lois.
Beca had a lower median score than Lois.
Beca had a lower range of scores than Lois.
Complete the table above with a set of possible scores gained by Beca.

END OF PAPER

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| $\begin{array}{\|l\|} \hline \text { Question } \\ \text { number } \\ \hline \end{array}$ | Additional page, if required. <br> Write the question number(s) in the left-hand margin. |
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