# revise.wales — Mark Scheme

**Mock Paper B — Unit 2: Non-Calculator (Foundation Tier)**

*65 marks. R.WM-MNF-U2-002 (MS).*

**Notation.** M$n$ = method mark; A$n$ = accuracy / answer mark; B$n$ = independent unsupported correct value; C$n$ = communication (OCW); ft = follow through from a prior error; oe = or equivalent; cao = correct answer only.

## Question 1 (5 marks)

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**(a)** **M1** $4 - (-5)$ or counts $9$ intervals between $R$ and $S$ on the number line.

**A1** $=$ **9** (cao).

**(b)** **B1** **50,000** (cao). The digit $5$ in $254{,}031$ sits in the ten-thousands place, so its value is $50{,}000$. Accept "fifty thousand" or "ten thousands" written in words. Do not accept "5" on its own (that is the digit, not its value).

**(c)** **M1** Identifies the thousands digit as $7$ and the next digit (hundreds) as $3$; applies the round-down rule ($3 < 5$).

**A1** $=$ **47,000** (cao). Penalise $48{,}000$ (wrong-direction rounding).

## Question 2 (7 marks)

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**(a)** **M1** Common denominator $10$: $\frac{1}{2} = \frac{5}{10}$ and $\frac{1}{5} = \frac{2}{10}$ (both seen).

**A1** $\frac{5}{10} - \frac{2}{10} = \mathbf{\frac{3}{10}}$ (cao). Already in simplest form.

**(b)** **M1** Recognises $5 \times 7 = 35$ (oe $\frac{5}{10} \times \frac{7}{10} = \frac{35}{100}$).

**M1** Places the decimal point correctly: $2$ decimal places in the product (one from each factor).

**A1** $=$ **0·35** (cao). Do not accept $3{\cdot}5$ or $0{\cdot}035$.

**(c)** **M1** Converts to a common form (all decimals): $\frac{1}{4} = 0{\cdot}25$, $\frac{1}{2} = 0{\cdot}5$, $\frac{3}{4} = 0{\cdot}75$ (any two correct conversions seen).

**A1** Correct order: $\mathbf{\frac{1}{4}}$, **0·3**, $\mathbf{\frac{1}{2}}$, **0·65**, $\mathbf{\frac{3}{4}}$ (cao). All five required.

## Question 3 (6 marks)

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**(a)** **M1** Completes factor tree: $4 = 2 \times 2$ and $21 = 3 \times 7$ (all four leaf nodes correct).

**A1** $84 =$ **2 × 2 × 3 × 7** or **$2^2$ × 3 × 7** (oe). Accept any correct product-of-primes form.

**(b)** **M1** Lists multiples of each: $6, 12, 18, \ldots$ and $9, 18, \ldots$; identifies the first common multiple (oe: prime factorisation $6 = 2 \times 3$, $9 = 3^2$, so LCM $= 2 \times 3^2$).

**A1** $=$ **18** (cao).

**(c)** **M1** Lists factors of each: $20 = 1, 2, 4, 5, 10, 20$ and $30 = 1, 2, 3, 5, 6, 10, 15, 30$; identifies the largest common factor (oe: $20 = 2^2 \times 5$, $30 = 2 \times 3 \times 5$, HCF $= 2 \times 5$).

**A1** $=$ **10** (cao).

**Question 4** **(7 marks)**

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**(a)** **M1** Substitutes both values: $2 \times 4 - 5 \times (-3)$ seen (with the negative carried).

**A1** $8 - (-15) = 8 + 15 =$ **23** (cao). Penalise sign errors that give $-7$.

**(b)** **M1** Collects like terms: $7p - 3p$ and $2q + 5q$ (both groups identified).

**A1** $=$ **4p** $+$ **7q** (cao). Accept $7q + 4p$.

**(c)** **B1** $=$ **6y** $+$ **15** (cao). Both terms required; penalise $6y + 5$ or $5y + 15$.

**(d)** **M1** Identifies the common factor of $4$ ($8m = 4 \times 2m$, $12 = 4 \times 3$).

**A1** $=$ **4**(**2m** $-$ **3**) (cao). Penalise partial factorisation such as "$2(4m - 6)$" (not fully factorised).

**Question 5** **(8 (6 + 2 OCW) marks)**

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**()** **M1** Identifies the common difference: each pattern adds $5$ tiles ($8 - 3 = 5$, $13 - 8 = 5$).

**M1** Writes a rule for Pattern $n$: **5n** $-$ **2** (oe in words: "five times the pattern number, take away two").

**A1** Rule **5n** $-$ **2** explicitly stated.

**M1** Sets up an equation using the rule: **5n** $-$ **2** $=$ **73**.

**M1** Rearranges: $5n = 73 + 2 = 75$.

**A1** $n = 75 \div 5 =$ **15** (cao). Pattern **15** uses $73$ tiles.

**C1** Working laid out in clear sentences with the rule, equation and solution all visible and correctly labelled.

**C1** Final answer expressed in context ("Pattern $15$" rather than a bare number) with correct algebraic notation throughout.

**Question 6** **(7 marks)**

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**(a)** **B1** $C(-2, 4)$ plotted within $\pm 2$ mm and labelled $C$.

**B1** $D(5, -3)$ plotted within $\pm 2$ mm and labelled $D$.

**(b)** **M1** Constructs a table of values for $y = -x + 3$ with at least three correct pairs. Expected values:
$x = -2 \Rightarrow y = 5$; $x = -1 \Rightarrow y = 4$; $x = 0 \Rightarrow y = 3$; $x = 1 \Rightarrow y = 2$; $x = 2 \Rightarrow y = 1$; $x = 3 \Rightarrow y = 0$; $x = 4 \Rightarrow y = -1$; $x = 5 \Rightarrow y = -2$.

**M1** Plots at least three correct points on the grid ($\pm 2$ mm tolerance).

**A1** Draws a single straight line through the plotted points across the full range $x = -2$ to $x = 5$. Penalise short, broken or free-hand lines.

**(c)** **M1** Reads the coefficient of $x$ directly from $y = -x + 3$; or computes "rise over run" from two points on the drawn line (e.g. from $(0, 3)$ to $(1, 2)$: $\frac{-1}{1}$).

**A1** Gradient $= -$**1** (cao). Penalise "$1$" (missing sign).

**Question 7** **(8 marks)**

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**(a)** **M1** States that angles around a point sum to $360°$ (reason).

**M1** $360 - 70 - 85 - 120$ (oe).

**A1** $z =$ **85**° (cao). Reason mark withheld if the $360$° fact is not given.

**(b)** **M1** Uses interior-angle formula: $\frac{(n-2)\times 180}{n}$ with $n = 5$ (oe: sum of interior angles $= (5-2) \times 180 = 540$° then $540 \div 5$).

**M1** Carries out the calculation: $\frac{3 \times 180}{5}$ or $\frac{540}{5}$.

**A1** $w =$ **108**° (cao).

**(c)** **M1** $(12 - 2) \times 180$ (oe).

**A1** $=$ **1800**° (cao). Penalise division by $12$ — the question asks for the sum, not one angle.

## Question 8 **(9 marks)**

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**(a)** **B1** P$(1) = \mathbf{\frac{3}{6}} = \frac{1}{2}$ (cao). Accept $0{\cdot}5$ or $50\%$.

**B1** P(odd) $= \mathbf{\frac{4}{6}} = \frac{2}{3}$ (cao; three $1$s and one $3$ out of $6$ sections). Accept any equivalent fraction, $0{\cdot}66\ldots$ or $66{\cdot}7\%$.

**B1** P$(5) =$ **0** (cao). The spinner has no $5$. Accept "impossible".

**(b)** **M1** Fills in at least $4$ of the remaining $6$ blank cells correctly.

**M1** Recognises symmetry of the sample space about the leading diagonal (oe: every cell entry equals row label + column label).

**A1** Full table correct:

| $+$ | 1 | 2 | 3 |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 2 | 3 | 4 | 5 |
| 3 | 4 | 5 | 6 |

**(c)** **M1** Counts the cells in the completed sample space giving a total of $4$: $(1,3), (2,2), (3,1)$ — three outcomes (ft from (b)).

**M1** Identifies total number of equally-likely outcomes $= 9$.

**A1** P(total $= 4$) $= \frac{3}{9} = \mathbf{\frac{1}{3}}$ (cao). Accept $0{\cdot}33\ldots$ or $33{\cdot}3\%$ or any equivalent fraction.

## Question 9 **(8 marks)**

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**(a)** **M1** Translates at least one vertex of $A$ correctly by $\binom{-5}{-4}$ (e.g. $(1,1) \mapsto (-4,-3)$).

**M1** Translates all three vertices correctly: $(1,1) \mapsto (-4,-3)$; $(3,1) \mapsto (-2,-3)$; $(1,3) \mapsto (-4,-1)$.

**A1** Triangle $P$ drawn with vertices $(-\mathbf{4}, -\mathbf{3})$, $(-\mathbf{2}, -\mathbf{3})$, $(-\mathbf{4}, -\mathbf{1})$ and labelled $P$ ($\pm 2$ mm tolerance).

**(b)** **M1** Reflects at least one vertex of $A$ correctly in the $x$-axis (e.g. $(1,1) \mapsto (1,-1)$).

**M1** Reflects all three vertices correctly: $(1,1) \mapsto (1,-1)$, $(3,1) \mapsto (3,-1)$, $(1,3) \mapsto (1,-3)$.

**A1** Triangle $Q$ drawn with vertices $(\mathbf{1}, -\mathbf{1})$, $(\mathbf{3}, -\mathbf{1})$, $(\mathbf{1}, -\mathbf{3})$ and labelled $Q$ ($\pm 2$ mm tolerance).

**(c)** **M1** Identifies the transformation as a *translation* (the triangles have the same orientation and size).

**A1** **Translation by the vector** $\binom{-4}{-3}$. Both elements required: translation and the correct column vector. Accept "$4$ left and $3$ down".

*Total:* $5 + 7 + 6 + 7 + 8 + 7 + 8 + 9 + 8 =$ **65** *marks.*