revise.wales — Mark Scheme

Mock Paper A — Unit 3: Calculator-Allowed (Foundation Tier)

75 marks. R.WM-MNF-U3-001 (MS).

Notation. Mn = method mark; An = accuracy / answer mark; Bn = independent unsupported correct value; Cn = communication (OCW); ft = follow through from a prior error; oe = or equivalent; cao = correct answer only.

Question 1 (5 marks)

(a) **M1** $0{\cdot}15 \times 840$ or $\dfrac{15}{100} \times 840$.

A1 $=$ **126** (cao).

(b) **B1** **38**,**000** (cao).

(c) **M1** $\dfrac{92-80}{80} \times 100$ or $\dfrac{12}{80} \times 100$ seen (oe).

A1 $=$ **15%** (cao).

Question 2 (8 marks)

(a) **M1** Uses $A = \frac{1}{2}(a+b)h$ with $a = 2{\cdot}4$, $b = 4{\cdot}0$, $h = 1{\cdot}2$ (oe).

M1 $\frac{1}{2}(2{\cdot}4 + 4{\cdot}0) = 3{\cdot}2$ seen (or sum of parallel sides $= 6{\cdot}4$).

M1 $3{\cdot}2 \times 1{\cdot}2$ (oe $6{\cdot}4 \times 1{\cdot}2 \div 2$).

A1 $=$ **3·84** m^2 (cao).

(b) **M1** Recognises $V = l \times w \times h$ (oe).

M1 60×40 (or 40×30, or 60×30) seen.

M1 $60 \times 40 \times 30$ (oe).

A1 $=$ **72**,**000** cm^3 (cao).

Question 3 (7 marks)

(a) **M1** States $a^2 + b^2 = c^2$ and identifies hypotenuse $= 5{\cdot}2$ (oe $5{\cdot}2^2 - 2{\cdot}0^2$ seen).

M1 $5{\cdot}2^2 - 2{\cdot}0^2$ or $27{\cdot}04 - 4 = 23{\cdot}04$ seen.

M1 $h = \sqrt{23{\cdot}04}$ (oe).

A1 $=$ **4·8** m (cao; 1 d.p.).

(b) **M1** Horizontal step $= 7 - 1 = 6$; vertical step $= 10 - 2 = 8$ (oe).

M1 $PQ^2 = 6^2 + 8^2 = 36 + 64 = 100$ (oe).

A1 $PQ = \sqrt{100} =$ **10** (cao).

Question 4 (8 marks)

(a) **M1** Identifies $AC = 9{\cdot}5$ cm as adjacent to $38°$ and BC as opposite (oe).

M1 $\tan 38° = \dfrac{BC}{9{\cdot}5}$ (oe).

M1 $BC = 9{\cdot}5 \times \tan 38°$ (oe; accept $0{\cdot}7813 \times 9{\cdot}5$).

A1 $=$ **7·4** cm (cao; 1 d.p.). Accept $7{\cdot}42$–$7{\cdot}43$ before rounding.

(b) **M1** Identifies PR as opposite the angle at Q and QR as adjacent (oe).

M1 $\tan(PQR) = \dfrac{PR}{QR} = \dfrac{4{\cdot}0}{7{\cdot}5}$ (oe).

M1 $PQR = \tan^{-1}\left(\dfrac{4{\cdot}0}{7{\cdot}5}\right)$ (oe).

A1 $=$ **28·1**° (cao; 1 d.p.).

Question 5 (9 (7 + 2 OCW) marks)

M1 Converts 5 cm to real distance: $5 \times 500 = 2{,}500$ m (oe).

A1 **2,500** m (oe $2{\cdot}5$ km) for HI.

M1 Converts 3 cm to real distance: $3 \times 500 = 1{,}500$ m (oe).

A1 **1,500** m (oe $1{\cdot}5$ km) for IL.

M1 Sums the two real distances: $2{,}500 + 1{,}500 = 4{,}000$ m and converts to km (oe).

A1 Total real distance $=$ **4** km (cao).

B1 Bearing of L from $I =$ **090**° (cao; must be three-figure).

C1 Working laid out in clear sentences, scale conversion stated once and applied consistently, units shown throughout.

C1 Final two answers stated separately and clearly (total distance in km; bearing as three-figure value).

Question 6 (7 marks)

(a) **M1** Converts time to hours: 2 h 30 min $= 2{\cdot}5$ h (oe).

M1 speed $= \dfrac{186}{2{\cdot}5}$ (oe).

A1 $=$ **74·4** km/h (cao).

(b) **M1** Calculates volume $V = 10 \times 6 \times 4$ (oe).

M1 $V = 240$ cm^3 seen.

M1 density $= \dfrac{\text{mass}}{\text{volume}} = \dfrac{1920}{240}$ (oe).

A1 $=$ **8** g/cm$^{\mathbf{3}}$ (cao).

Question 7 (8 marks)

(a) **M1** Recognises full circle $= 360°$ represents 120 pupils, so each $1°$ represents $120 \div 360 = \frac{1}{3}$ of a pupil (oe).

M1 $\dfrac{90}{360} \times 120$ (oe).

A1 $=$ **30** pupils (cao).

(b) **M1** Reads temperature at $08{:}00$ from graph: 11 °C (accept 10–12).

M1 Reads temperature at $16{:}00$ from graph: 18 °C (accept 17–19).

A1 Rise $= 18 - 11 =$ **7** °C (cao; accept 6–8 °C for graph-read tolerance).

(c) **B1** States that the differences between values look bigger / exaggerated because the

axis does not start at zero (oe).

B1 Refers explicitly to the truncated vertical axis ("starts at 10" / "zero is missing" / "not to scale from zero").

Question 8 (11 marks)

(a) **M1** Sum of scores: $12 + 15 + 9 + 17 + 11 + 15 + 8 = 87$ (oe).

A1 Mean $= 87 \div 7 =$ **12·43** (accept $12{\cdot}4$ or $\frac{87}{7}$).

B1 Median: ordered list $8, 9, 11, 12, 15, 15, 17 \Rightarrow$ median $=$ **12** (cao).

B1 Mode $=$ **15** (cao).

B1 Range $= 17 - 8 =$ **9** (cao).

(b) **M1** Identifies midpoints $10, 30, 50, 70, 90$ (all five; oe).

M1 Calculates $\sum f \cdot x = 6{\cdot}10 + 14{\cdot}30 + 18{\cdot}50 + 9{\cdot}70 + 3{\cdot}90 = 60 + 420 + 900 + 630 + 270 = 2280$ (oe).

M1 Divides by $\sum f = 50$: $2280 \div 50$.

A1 Estimated mean $=$ **45·6** minutes (cao; 1 d.p.).

(c) **B1** Modal class $=$ **40 < t ≤ 60** (cao).

(d) **B1** Median class $=$ **40 < t ≤ 60** (cao). [Position $25/26$ lies in the third class.]

Question 9 (12 marks)

(a) **B1** Point plotted at approximately $(158, 6)$ on the scatter graph (tolerance ± 1 cm horizontally, $\pm\frac{1}{2}$ shoe size vertically).

(b) **B1** **Positive** correlation (cao). Accept "strong positive" / "positive linear". Do not accept "positive proportional".

(c) **B1** Straight line of best fit drawn through the middle of the data, going from approximately $(142, 3)$ to $(178, 9)$ with roughly equal numbers of points above and below.

(d) **M1** Reads from the line of best fit at 170 cm.

A1 **8** (accept 7–$8\frac{1}{2}$ for line-of-best-fit tolerance; whole or half size acceptable).

(e) **M1** Identifies the corresponding sides AB and DE and forms the ratio $15 \div 6$ (oe).

A1 Scale factor $=$ **2·5** (cao).

M1 $EF = 8 \times 2{\cdot}5$ (ft scale factor).

A1 $=$ **20** cm (cao).

(f) **M1** Recognises that area scale factor $=$ (linear scale factor)^2: $2{\cdot}5^2 = 6{\cdot}25$ (ft).

M1 $24 \times 6{\cdot}25$ (oe).

A1 $=$ **150** cm^2 (cao).

Total: $5 + 8 + 7 + 8 + 9 + 7 + 8 + 11 + 12 =$ **75** *marks.*