

revise.wales — Mark Scheme

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

75 marks. R.WM-MNF-U3-002 (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)

- (a) **M1** 0.20×650 or $\frac{20}{100} \times 650$.
A1 = 130 (cao).
- (b) **B1** 50,000 (cao).
- (c) **M1** $\frac{45 - 36}{45} \times 100$ or $\frac{9}{45} \times 100$ seen (oe).
A1 = 20% (cao).

Question 2 (8 marks)

- (a) **M1** Uses $A = b \times h$ for a parallelogram (oe).
M1 Identifies $b = 7.5$ and perpendicular height $h = 4.2$.
M1 7.5×4.2 (oe).
A1 = 31.5 m² (cao).
- (b) **M1** Uses $V = \pi r^2 h$ (oe).
M1 $\pi \times 5^2$ or $\pi \times 25$ seen.
M1 $\pi \times 25 \times 12$ (oe).
A1 = 942 cm³ (cao; accept 942–942.48; using $\pi = 3.14$ gives 942).

Question 3 (7 marks)

- (a) **M1** States $a^2 + b^2 = c^2$ and identifies d as the hypotenuse of a right-angled triangle with legs 80 and 45 (oe).
M1 $80^2 + 45^2$ or $6400 + 2025 = 8425$ seen.
M1 $d = \sqrt{8425}$ (oe).
A1 = 91.8 cm (cao; 1 d.p.). Accept 91.78–91.79 before rounding.
- (b) **M1** Identifies the string as the hypotenuse of a right-angled triangle with legs 18 and 24 (oe).
M1 $s^2 = 18^2 + 24^2 = 324 + 576 = 900$ (oe).
A1 $s = \sqrt{900} = 30$ m (cao).

Question 4 (8 marks)

- (a) **M1** Identifies 1.5 m as opposite the angle θ and 8 m as the hypotenuse (oe).

M1 $\sin \theta = \frac{1.5}{8}$ (oe).

M1 $\theta = \sin^{-1}\left(\frac{1.5}{8}\right)$ (oe; accept $\sin^{-1}(0.1875)$).

A1 = 10.8° (cao; 1 d.p.). Accept 10.80–10.81 before rounding.

(b) **M1** Identifies YZ as the side opposite the 55° angle and $XZ = 12$ cm as the hypotenuse (oe).

M1 $\sin 55^\circ = \frac{YZ}{12}$ (oe).

M1 $YZ = 12 \times \sin 55^\circ$ (oe; accept 12×0.8192).

A1 = 9.8 cm (cao; 1 d.p.). Accept 9.82–9.83 before rounding.

Question 5

(9 (7 + 2 OCW) marks)

M1 Converts 4 cm to real distance: $4 \times 200 = 800$ m (oe).

A1 **800** m (oe 0.8 km) for MF .

M1 Converts 3 cm to real distance: $3 \times 200 = 600$ m (oe).

A1 **600** m (oe 0.6 km) for FA .

M1 Sums the two real distances: $800 + 600 = 1400$ m and converts to km (oe).

A1 Total real distance = **1.4** km (cao).

B1 Bearing of A from $F = 180^\circ$ (cao; must be three-figure; A is due south of F).

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** Uses rate = $\frac{\text{volume}}{\text{time}}$ (oe).

M1 $\frac{4500}{15}$ (oe).

A1 = **300** litres/min (cao).

(b) **M1** Converts 80 cm to 0.8 m (oe).

M1 Calculates area in m^2 : $0.8 \times 0.8 = 0.64 \text{ m}^2$ (oe).

M1 pressure = $\frac{\text{force}}{\text{area}} = \frac{240}{0.64}$ (oe).

A1 = **375** N/m^2 (cao).

Question 7

(8 marks)

(a) **M1** Reads pictogram correctly: Wednesday = $6 \times 4 = 24$ books; Friday = $8 \times 4 = 32$ books (oe; allow one slip).

M1 $24 + 32$ seen (ft from candidate's counts).

A1 = **56** books (cao).

(b) **M1** Identifies the modal class as the interval with the highest frequency on the polygon (oe).

M1 Reads peak frequency at midpoint 157.5 cm with frequency 12 (oe).

A1 Modal class = **155** < **h** ≤ **160** cm (cao; accept 155–160 cm oe).

(c) **B1** States that the differences between bar heights look bigger / exaggerated because the axis does not start at zero (oe).

B1 Refers explicitly to the truncated vertical axis (“starts at 8” / “zero is missing” / “not to scale from zero”).

Question 8

(11 marks)

(a) **M1** Sum of scores: $14 + 9 + 11 + 14 + 7 + 18 + 13 = 86$ (oe).

A1 Mean = $86 \div 7 = \mathbf{12.29}$ (accept 12.3 or $\frac{86}{7}$).

B1 Median: ordered list 7, 9, 11, 13, 14, 14, 18 ⇒ median = **13** (cao).

B1 Mode = **14** (cao).

B1 Range = $18 - 7 = \mathbf{11}$ (cao).

(b) **M1** Identifies midpoints 5, 15, 25, 35, 45 (all five; oe).

M1 Calculates $\sum f \cdot x = 4 \cdot 5 + 12 \cdot 15 + 16 \cdot 25 + 10 \cdot 35 + 8 \cdot 45 = 20 + 180 + 400 + 350 + 360 = 1310$ (oe).

M1 Divides by $\sum f = 50$: $1310 \div 50$.

A1 Estimated mean = **26.2** minutes (cao; 1 d.p.).

(c) **B1** Modal class = **20** < **t** ≤ **30** (cao).

(d) **B1** Median class = **20** < **t** ≤ **30** (cao). [Position 25/26 lies in the third class; cumulative frequencies 4, 16, 32.]

Question 9

(12 marks)

(a) **B1** Point plotted at approximately (13, 0.44) on the scatter graph (tolerance $\pm \frac{1}{2}$ year horizontally, ± 0.01 s vertically).

(b) **B1** **Negative** correlation (cao). Accept “strong negative” / “negative linear”. Do not accept “negative proportional”.

(c) **B1** Straight line of best fit drawn through the middle of the data, going from approximately (10, 0.50) to (18, 0.24) with roughly equal numbers of points above and below.

(d) **M1** Reads from the line of best fit at age 16 years.

A1 **0.30** s (accept 0.28–0.32 s for line-of-best-fit tolerance).

(e) **M1** Identifies the corresponding sides PQ and ST and forms the ratio $10 \div 4$ (oe).

A1 Scale factor = **2.5** (cao).

M1 $TU = 10 \times 2.5$ (ft scale factor).

A1 = **25** cm (cao).

(f) **M1** Recognises that area scale factor = (linear scale factor)²: $2.5^2 = 6.25$ (ft).

M1 20×6.25 (oe).

A1 = **125** cm² (cao).

Total: $5 + 8 + 7 + 8 + 9 + 7 + 8 + 11 + 12 = \mathbf{75}$ marks.