

MATHEMATICS - NUMERACY 2 nd SAMs 2017 Unit 2 (Calculator allowed) Intermediate Tier	Mark	MARK SCHEME Comments (Page 1)
1. Use of 30 teabags (for £1.80) Method to compare, e.g. multiples of 30 & 40: 30, 60, 90, 120 & 40, 80, 120 $4 \times 1.8(0)$ and 3×2.60 (£)7.2(0) and (£)7.8(0) or equivalent Offer A (20 teabags + 50% free) is better value	B1 M1 m1 A1 E1 5	OR equivalent, e.g. 1 or 10 teabags considered for both bags of 30 & 40 OR $1(.)80 \div 3(0)$ and $2(.)60 \div 4(0)$ with consistent place value to compare OR 60(p for 10) and 65(p for 10) with consistent place value to compare OR 60(p for 10) and (£) $2(.)60 - (£)1(.)80 = 80p$ for extra 10 OR 2.40 for 40 OR $1.80 \div 30 \times 40$ OR $1.80 \div 3 \times 4$ OR 60(p) for 10 and 80(p) for extra 10. Depends on M1, m1 awarded with appropriate FT Accept answers suggesting 'depends if you need 40 teabags exactly' etc. provided M1, m1, A1 previously awarded. <i>SC1 for an answer based on comparison of 20 teabags for £1.80 with 40 teabags for £2.60, appropriate working with conclusion of 40 teabags</i>
2.(a) 150 (b) 325	B1 B1 2	
3.(a) $7\text{cm} (\pm 0.2\text{cm}) \times 8 (\div 100)$ 0.56 (m) (b) Measuring 2 appropriate angles ($\pm 2^\circ$) to check interior (allied), or appropriate corresponding or alternate angles Conclusion based on the angles measured and accurate knowledge of parallel line angle facts.	M1 A1 B1 E1 4	Award M1 only for answers 56cm or 56m or 56 or similar from $\pm 0.2\text{cm}$ tolerance The size of angles may not actually be recorded, e.g. on diagram equal angles marked x and y. Accept references to the angles which are equal or sum to 180° Do not accept 'travelling in the same direction so won't meet'

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4.(a) £480 (b) £1620 (c)(i) Paying for 10m 11×1mth (11×10×40×1.2 =) (£)5280 AND 12mth charge (320×10×1.2 =) (£)3840 6mth + 5×1mth 180×10 + 5×40×10 (×1.2) (£)4560 Conclusion to pay annual charge based on the calculation of all 3 possibilities Organisation and communication Accuracy of writing (ii) Greatest saving (£5280 - £3840 =) (£)1440	B1 B1 B1 B2 M1 A1 E1 OC1 W1 B1 11	 If not awarded, FT use of 9m throughout B1 for either correct, or if neither correct award for excluding VAT charges of (£)4400 and (£)3200 respectively Accept excluding VAT (£3800) FT appropriate conclusion depending on the sight of any two of the 3 correct charges given including VAT If misread not using 'per metre' consistently, hence MR-1, then B0, then FT throughout FT their least of 3 possibilities subtracted correctly from their greatest of 3 possibilities
5.(a) 5.5 (metres) (b) Intention to read horizontal scale for depth of 3m filling 36 (minutes) (c) 13(:)36 or 1 36 pm AND 18(:)36 or 6 36 pm (d) 4 th statement identified	B1 M1 A1 B2 B1 6	Accept answers in the range 5.4 to 5.6 inclusive Accept sight of 0.6 (hours) B1 for either correct, or B1 if both given with incorrect time notation or B1 for two times given that are 5 hours apart e.g. 14:36 and 19:36, i.e. FT 'their first time' + 5 hours for second B1. B0 if more than one statement identified.
6.(a) $9 \times 10 + 160 = 250$ or equivalent 50(°F) (b) $9c = 5f - 160$ $c = \frac{5f - 160}{9}$ or $c = \frac{5}{9}(f - 32)$	M1 A1 B1 B1 4	 FT until 2 nd error
7. (a)(i) 253(°) (ii) $360 - 42 = 318(°)$ (b) 60° with construction arcs (30° by) bisecting 'their angle', with arcs shown Correct 30° from appropriate construction with line shown at the right hand end of the given line	B1 M1 A1 M1 M1 A1 6	 SC1 for answers of 073(°) and 138(°) in (i) and (ii) Accept anywhere on the line Allow sight of construction arcs for 60° Line (road) may not be shown Depends on both M marks

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8.(a) $2 \times (8.5 + 4.6) + 4 \times 2.2$ (+ 18) and no others = 53 (cm) (b) $2 \times l + 2 \times w + 4 \times h + 18$ (cm) or equivalent (and no extras)	M2 A1 B2 5	Or equivalent. Attempt to consider all 6 faces or all 8 lengths (+ 18) M1 for omitting one dimension OR for adding all three dimensions with at least one multiplied by 2 or 4. CAO. An answer of 35 implies M2A0. B1 for 1 error or 1 slip in notation. Treat an answer of $l + w + 4 \times h + 18$ as 1 error (omitting bottom), hence award B1. If B2 penalise extra incorrect working -1
9.(a) 250×4.37 = 1092.5(0) (Buys) 1050 (zloty) $1050 \div 4.37$ = (£)240.27(46) (b) $(1050 - 340.40 \div 4.43)$ 709 ÷ 4.43 (£) 160.05	M1 A1 A1 M1 A1 B1 M1 A1 8	FT provided M1 awarded FT 'their 1050 zloty' provided rounded to the nearest 50. Must be in zloty not £s. FT 'their (a)' provided >340.40 FT rounding down their 709.60 to whole number Accept (£)160.04 but not (£)160.045 An answer of (£)160.18 (omitting to round down) should be awarded B1 then SC1 in (b). An answer of (£)160.27 (rounding up instead of down) should be awarded SC1, with B1 if 709.6(0) seen.
10. 400×1.01^{14} or equivalent full method (£)459.79	M2 A1 3	M1 for correctly multiplying by 1.01^n where n is a positive integer. Award M2A0 for (£)459.789(685...)
11.(a) $50\,000 \div 0.35 =$ 142857 (b) (Total power in MW is) $2.0 \times 30 + 3.5 \times 54 + 3.6 \times 25 + 3.0 \times 60$ (Total number of turbines $30 + 54 + 25 + 60 = 169$) (Mean full power of a turbine is) $519 \div 169$ 3.07(1.... MW) (At 45% power) $0.45 \times 3.07(\dots)$ or equivalent 1.38 (MW)	M1 A1 M1 m1 A1 m1 A1 7	($\Sigma fx = 60 + 189 + 90 + 180 = 519$) FT 'their Σfx ' ÷ 'their 517' CAO. Do not accept 3.1 or 3 (MW) FT 'their 3.07(...)' provided M1, m1 previously awarded Their answer must be given correct to 2 decimal places, i.e. award M1A0 for 1.381(95...) or 1.3815 or 1.382. Alternative: (45% power) $0.45 \times 2, 0.45 \times 3.5, 0.45 \times 3.6,$ 0.45×3 M1 $0.9 \times 30 + 1.575 \times 54 + 1.62 \times 25 + 1.35 \times 60$ m1 233.55 (MW) CAO A1 ÷169 m1 1.38 (MW) A1

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12. (a) 0, 5, 25, 49, 83, 113, 120 (b) 3 unique vertical plots correct at upper bounds All plots correct and joined, including to 0 at t=2.5 (c) Use of 15 minutes Conclusion: Target beaten by $2\frac{1}{2}$ minutes (d) TRUE FALSE TRUE TRUE FALSE	B2 M1 A1 M1 A1 B2 8	B1 for any three correct values, OR FT from 1 error for finding 3 further cumulative values accurately Only FT their cumulative table to (c) <i>Accuracy of plotting: time on the grid line, cumulative frequency within the appropriate square with 1st & last plots on the grid lines</i> B1 for any 4 correct FT their cumulative frequency diagram CAO CAO FT their cumulative frequency diagram CAO
13.(a) Form and use a right-angled triangle with base 55cm and height 50 cm. Tan x = 50/55 42(°) or 42.3(°) (a) Reason, e.g. 'original measurements may not have been accurate', or 'doesn't consider the thickness of the wood', ...	S1 M1 A3 E1 6	Or alternative FULL method. A2 for 42.27....(°) A1 for $\tan^{-1} 0.909...$ or $\tan^{-1} (50/55)$
14. Attempt to use Pythagoras' Theorem, e.g. $\text{length}^2 + \text{width}^2 = 2.5^2$ Use of $\text{length} = 2 \times \text{width}$ $(2 \times \text{width})^2 + \text{width}^2 = 2.5^2$ or equivalent $\text{width}^2 = 1.25$ or $\text{width} = \sqrt{1.25}$ Width 1.1(2 metres) or 1.118(03... metres)	M1 M1 m1 m1 A1 5	OR equivalent. If units are given they must be correct. <i>Alternative:</i> <i>Attempt to use Pythagoras' Theorem, e.g. $\text{length}^2 + \text{width}^2 = 2.5^2$</i> M1 <i>Use of $\text{length} = 2 \times \text{width}$</i> M1 <i>Trial of a pair of values(< 2.5), one double the other in Pythagoras' Theorem</i> m1 <i>Trial of a pair of values(< 2.5), one double the other in Pythagoras' Theorem with improvement, closer to 2.5m</i> m1 <i>Width 1.1 metres or equivalent</i> A1