GCSE MATHEMATICS
MARK SCHEME – Specimen Paper Unit 3 (Terminal) Higher Modular Section B
Issue 2

Questions	Working	Answer	Mark	Notes
1		3, 6, 6, 7.5	**2**	B2 all four correct (B1 for two correct)
2	360° ÷ 20° =	18	**2**	M1 360 ÷ 20 A1 cao
3		$14G + 121$	**2**	B2 cao (B1 for $14G$)
4	3.142 × 20.9 = 65.6678 (65.6-65.7) 65.6678 ÷ 2 = 32.8339 (32.8 - 32.9) 32.8339 + 20.9 =	53.7	**4**	M1 for 3.142 × 20.9 or $\pi \times 20.9$ or 3.142 × 20.9/2 or π × 20.7/2 or 65.7 seen A1 for 32.8-32.9 seen for arc length B1 ft (indep) for "32.8" + 20.9 or 53.7-53.8 A1 for rounding to 53.7 NB: allow use of 3.14, 22/7 instead of 3.142
5 (a)	$6^2 + 4.5^2 = 56.25$ $\sqrt{56.25} = 7.5$	7.5	**2**	M1 for $6^2 + 4.5^2$ A1 cao
(b)	6 × 4.5 ÷ 2 = 13.5 13.5 × 10	135	**3**	M1 for 6 × 4.5 ÷ 2 M1 (dep) for 13.5 A1 cao
6		$3x^5y^5$	**2**	B2 cao (B1 for $3x^?y^5$ or $3x^5y^?$ where ? is not 5)
7		3.2	**4**	B2 for a trial between 3.1 and 3.5 incl (B1 for a trial between 3 and 4 incl) B1 for a trial between 3.2 and 3.3 excl B1 for 3.2 (dep on at least B1)
8		2^{nd} , 6^{th} , 7^{th}	**3**	B3 (B1 for each, –1 each extra)

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9 (a)	$84 \times 92.5 =$	£77.70	**3**	M2 84×92.5 (M1 for $84 - (84 \times 7.5/100)$ A1 cao
(b)	$12\,000 \times 0.75 = 9000$ $9000 \times 0.75 = 6750$ $6750 \times 0.75 = 5062.5$	£5062.50	**3**	M1 for $12\,000 \times 0.75$ or sight of 9000 M1 for continued use of 0.75 (at least one further step) A1 cao
(c)	$0.8 \times 0.8 \times 0.8 \times 0.8$	0.4096	**2**	M1 $0.8 \times 0.8 \times 0.8 \times 0.8$ or 0.8^4 A1 cao
10 (a)	$18 \times (63/81) =$	14	**2**	M1 63/81 or 81/63 or 1.2857.. or 0.7777.. A1 cao
(b)	Cosine Rule: $70^2 = 18^2 + 81^2 - 2 \times 18 \times 81 \times \cos A$	47.1°	**3**	M1 $70^2 = 18^2 + 81^2 - 2 \times 18 \times 81 \times \cos A$ M1 either $\cos A = \frac{18^2 + 81^2 - 70^2}{2 \times 18 \times 81}$ or $70^2 = 6885 - 2916 \cos A$ A1 cao
11	D, C, E, F, A, B	DCEFAB	**3**	B3 cao (B2 for 4 correct B1 for 2 correct)
12	$5x - 3x \leq 14 - 7$ $2x \leq 7$	$x \leq 3.5$	**2**	M1 for $5x - 3x \leq 14 - 7$ o.e. A1 for $x \leq 3.5$ o.e.
13	$18.85 \div 3.6$	5.23611111	**2**	B1 for 18.85 as numerator or 3.6 as denominator B1 5.23611 or better
14		$n = 3$ $p = 37$ 111	**2** **1**	B1 for n cao B1 for p cao B1 cao

15	$(2+\sqrt{5})(2+\sqrt{5}) = 4 + 2\sqrt{5} + 2\sqrt{5} + 5$	$9 + 4\sqrt{5}$	**2**	M1 for $4 + 2\sqrt{5} + 2\sqrt{5} + 5$ or better A1 cao (accept $a = 9$, $b = 4$)

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16 (a)	Total time = $\frac{D_1}{V_1} + \frac{D_2}{V_2} = \frac{20}{x} + \frac{20}{x-2}$ So $\frac{20}{x} + \frac{20}{x-2} = 4$		**2**	M1 any two of $\frac{20}{x}$, $\frac{20}{x-2}$, =4 A1 cao
(b)	$20(x-2) + 20x = 4x(x-2)$ $20x - 40 + 20x = 4x^2 - 8x$ $4x^2 - 48x + 40 = 0$ $x^2 - 12x + 10 = 0$		**2**	M1 Correct removal of denominators A1 Convincing algebra throughout .
(c)	$\frac{-(-12) \pm \sqrt{(12^2 - 4.1.10)}}{2}$ $\frac{12 \pm \sqrt{104}}{2}$ $x = 11.099$ or 0.90098	11.1, 0.9	**3**	M1 correct substitution A2 11.1 and 0.9 (A1 one answer)
(d)			**1**	B1: Substitution of 0.9 into the speed for the return home ($x - 2$) would give a negative value
17	Height s.f. = $20 \div 12 = \frac{5}{3}$ Vol s.f. = $(\frac{5}{3})^3$ V = $162 \times (\frac{5}{3})^3$	750	**3**	B1 for volume s.f. M1 for vol s.f. × 162 A1 cao