Practice Tests Set 7 – Paper 2H mark scheme – Spring 2018

Qn		Working	Answer	Mark	Notes
1		$3 \times (-2)^2 - (5 \times -2)$ **or** $3(-2)^2 - 5(-2)$ **or** $3 \times (-2)^2 - 5 \times -2$ **or** $3 \times 4 - 5 \times -2$	22	2	M1 **or** 12 – – 10 **or** 12 + 10 **or** 12 and –10 A1 cao
2	(a)	$2.1 \div (1 + 2 + 3)$ (= 0.35) **or** $2.1 \div 6$ $2.1 \div (1 + 2 + 3) \times 2$ **or** $2.1 \div 6 \times 2$	0.7	2	M1 allow $2.1 \div (1 + 2 + 3) \times 3$ (=1.05) for the method mark A1 (accept 0.70)
	(b)	$6 \div 3 = 2$ **and** 2×0.75 **or** $\frac{0.75}{3} \times 6$ oe	1.5	2	M1 for a complete method A1 cao
3			11	4	M1 for $3x + 2 = 87 - 2x$ M1 for $5x + 32$ M1 for $5x = 55$ A1 cao
4	(a)		1160	3	B1
	(b)		1.16×10^3		B1 ft
	(c)		1200 (oe)		B1 ft

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5	(a)	$\frac{4}{9}$		3	B1
		$\frac{4}{5}, \frac{1}{5}$			B1
		$\frac{3}{6}, \frac{3}{6}$			B1
	(b)	$\frac{5}{9} \times \frac{4}{5} + \frac{4}{9} \times \frac{3}{6}$			M1, M1
		$\frac{2}{3}$			A1
		$1 - \frac{2}{3}$			M1
		Conclusion			C1
6	(a)		$(x - 4)(x + 4)$	1	B1
	(b)		$(3x - 1)^2$	2	B1 for $(3x - 1)(..x....)$ cao B2 for $(3x - 1)^2$ cao
	(c)	$\frac{(3x-1)(2x+3)}{(3x-1)^2} = \frac{(2x+3)}{(3x-1)}$	$\frac{2x+3}{3x-1}$		B1 for correct factorisation of numerator M1 for cancelling of common factors A1 cao

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7				2	M1 $\frac{40}{360}\times 2\times \pi \times 7$ oe A1 4.8 – 4.9
8		$\frac{3w+20}{200}=1$ $3w+20=200$	60	3	M1 p = 1 stated or used M1dep $3w+20=200$ oe A1 cao
9	(a)		(1, 4)	3	B1
	(b)		–0.4, 2.4		B1
	(c)		3.75		B1 accept 3.7 – 3.8
10	(a)	$\frac{3}{10}\times\frac{5}{6}$		2	M1
			$\frac{15}{60}$ or $\frac{1}{4}$		A1 Accept $\frac{3}{12}$, $\frac{5}{20}$
	(b)		24	2	B1 for multiple of 24
11		$4(2y + 1) = 3(y - 2)$	–2	4	M1 for clear intention to multiply both sides by 12 or by

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					a multiple of 12 eg $4(2y + 1) = 3(y - 2)$ $2y + 1 \times 4 = y - 2 \times 3$ $12 \times \frac{2y+1}{3} = 12 \times \frac{y-2}{4}$
		$8y + 4 = 3y - 6$			M1 for correct expansion of brackets or correct rearrangement of correct terms e.g. $8y - 3y = -6 - 4$, $\frac{8y+4}{12} = \frac{3y-6}{12}$
		$5y = -6 - 4$ or $8y - 3y = -10$ or $5y = -10$ or $-5y = 6 + 4$ or $3y - 8y = 10$ or $-5y = 10$ or $5y + 10 = 0$			M1 for correct rearrangement with y terms on one side and numbers on the other AND collection of terms on at least one side or for $5y + 10 = 0$ oe or for $\frac{5y+10}{12} = 0$ oe A1 Award 4 marks if answer is correct and at least one method mark scored
12	(a)	2 correct points plotted		2	

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	(b)	e.g (0, 4) and (3, 0) $4x + 3y = 12$ drawn 		3	Correct region B2 for $x = 4$ and $y = -3$ drawn **and** consistent shading correct for at least two inequalities B1 for $x = 4$ and $y = -3$ drawn
13		$a^2 = 1 - \frac{b^2}{c^2}$ $c^2a^2 = c^2 - b^2$ **OR** $\frac{b^2}{c^2} = 1 - a^2$ **OR** $a^2 = \frac{c^2 - b^2}{c^2}$ $c^2 = \frac{b^2}{1 - a^2}$ (isolating c^2) $c = \sqrt{\frac{b^2}{1 - a^2}}$ (oe)		3	M1 M1 dep A1
14				3	M1 correct coefficient

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			$2x^2 + 7x + 4=0$		M1 finding a and c or b and c A1 cao
15	(a)		26	3	M1 for using values 0 and 6 M1 for substituting values into trapezium rule, e.g. $\frac{1}{2} \times 2 \times ((0 + 8) + 2(4 + 5))$ A1 cao
	(b)			1	C1 under-estimate as chords are under curve
	(c)		3.4 – 3.9	2	M1 tangent to curve drawn at $t = 8$
	(d)			1	C1 acceleration in m/s²
16		Number of boys possible is 15 Number of possible girls is 9 Each boy can be paired with 9 different girls 15×9	135 Tom with correct reason		P1 Process to find the number of combinations A1 for 135 C1 Convincing reason eg. correct calculation is $15 \times 14 \div 2$
17		$a : b = 30 : 48$ or $b : c = 48 : 200$ $a : b : c = 30 : 48 : 200$	 15 : 24 : 100	3	M1 A1, A1

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18			300 and correct assumption	4	M1 for partial working, e.g. $\frac{20}{8}$ oe or 40% or $\frac{2}{5}$ or $20 \div 8$ or $\frac{8}{20}$ seen M1 for complete method e.g. $\frac{120 \times 20}{8}$ or 15×20 or $\frac{120}{n} = \frac{8}{20}$ or $120 \div 0.4$ oe A1 cao C1 for a correct mathematical assumption, e.g. mark does not wear off or sample is random or population has not changed, etc
19		e.g. $\left(\frac{1}{8\times10^{9n}}\right)^{\frac{1}{3}}$ **or** $\left(2\times10^{3n}\right)^{-1}$ **or** $\frac{1}{\sqrt[3]{8\times10^{9n}}}$ **or** $\left(\sqrt[3]{8\times10^{9n}}\right)^{-1}$ **or** $(8^{\frac{-1}{3}}\times10^{\frac{-9n}{3}})$ **or**			Correct first stage.

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		$\left[\frac{1}{8^{\frac{1}{3}}} \text{ and } \frac{1}{\left(10^{9n}\right)^{\frac{1}{3}}}\right]$ **or** $\left[2^{-1} \text{ and } (10^{3n})^{-1}\right]$ oe e.g. $\frac{1}{2\times10^{3n}}$ **or** 0.5×10^{-3n} oe **or** $\left[8^{\frac{-1}{3}} = 0.5 \text{ and } (10^{9n})^{\frac{-1}{3}} = 10^{-3n}\right]$	$5 \times 10^{-3n-1}$	3	For dealing with $8^{-⅓}$ (shown as ½ or 0.5) and $(10^{9n})^{-⅓}$ shown as 10^{-3n} $5 \times 10^{-(3n+1)}$
20	(a)	$\frac{3}{6} \times \frac{3}{6}$	$\frac{9}{36}$	2	M1 A1 cao
	(b)	$\frac{3}{6} \times \frac{3}{6}$		3	M1

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		$\frac{1}{6} \times \frac{5}{6} + \frac{2}{6} \times \frac{3}{6}$ $\frac{1}{6} \times \frac{2}{6} + \frac{1}{6} \times \frac{3}{6} + \frac{2}{6} \times \frac{3}{6}$ $\frac{3}{6} \times \frac{3}{6} + \frac{1}{6} \times \frac{2}{6}$	$\frac{11}{36}$		M1 for terms seen A1

Suggested grade boundaries

	9	8	7	6	5	4
Paper 1H	**68**	**60**	**52**	**44**	**35**	**26**
Paper 2H	**72**	**62**	**52**	**42**	**32**	**22**
Paper 3H	**58**	**50**	**42**	**34**	**26**	**18**
Total	**198**	**172**	**146**	**120**	**93**	**66**