

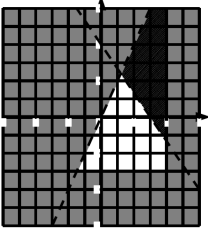
Practice Tests Set 7 – Paper 2H mark scheme – Spring 2018

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

Qn	Working	Answer	Mark	Notes
5	<p>(a) <math>\frac{4}{9}</math></p> <p><math>\frac{4}{5}, \frac{1}{5}</math></p> <p><math>\frac{3}{6}, \frac{3}{6}</math></p> <p>(b) <math>\frac{5}{9} \times \frac{4}{5} + \frac{4}{9} \times \frac{3}{6}</math></p> <p><math>\frac{2}{3}</math></p> <p><math>1 - \frac{2}{3}</math></p> <p>Conclusion</p>		3	<p>B1</p> <p>B1</p> <p>B1</p> <p>M1, M1</p> <p>A1</p> <p>M1</p> <p>C1</p>
6	<p>(a)</p> <p>(b)</p> <p>(c) <math>\frac{(3x-1)(2x+3)}{(3x-1)^2} = \frac{(2x+3)}{(3x-1)}</math></p>	<p><math>(x-4)(x+4)</math></p> <p><math>(3x-1)^2</math></p> <p><math>\frac{2x+3}{3x-1}</math></p>	<p>1</p> <p>2</p>	<p>B1</p> <p>B1 for <math>(3x-1)(..x\dots)</math> cao</p> <p>B2 for <math>(3x-1)^2</math> cao</p> <p>B1 for correct factorisation of numerator</p> <p>M1 for cancelling of common factors</p> <p>A1 cao</p>

Qn	Working	Answer	Mark	Notes
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) (b) (c)	(1, 4) -0.4, 2.4 3.75	3	B1 B1 B1 accept 3.7 – 3.8
10	(a) $\frac{3}{10} \times \frac{5}{6}$  (b)	$\frac{15}{60}$ or $\frac{1}{4}$  24	2  2	M1  A1 Accept $\frac{3}{12}, \frac{5}{20}$  B1 for multiple of 24

Qn	Working	Answer	Mark	Notes
11	$4(2y + 1) = 3(y - 2)$ $8y + 4 = 3y - 6$ $5y = -6 - 4 \text{ or } 8y - 3y = -10$ $\text{or } 5y = -10$ $\text{or } -5y = 6 + 4 \text{ or } 3y - 8y = 10$ $\text{or } -5y = 10 \text{ or } 5y + 10 = 0$	-2	4	<p>M1 for clear intention to multiply both sides by 12 or by a multiple of 12</p> <p>eg <math>4(2y + 1) = 3(y - 2)</math></p> <p><math>2y + 1 \times 4 = y - 2 \times 3</math></p> <p><math>12 \times \frac{2y+1}{3} = 12 \times \frac{y-2}{4}</math></p> <p>M1 for correct expansion of brackets or correct rearrangement of correct terms</p> <p>e.g. <math>8y - 3y = -6 - 4</math>, <math>\frac{8y+4}{12} = \frac{3y-6}{12}</math></p> <p>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 <math>5y + 10 = 0</math> oe or for <math>\frac{5y+10}{12} = 0</math> oe</p> <p>A1 Award 4 marks if answer is correct and at least one method mark scored</p>

Qn	Working	Answer	Mark	Notes
12	<p>(a) 2 correct points plotted e.g (0, 4) and (3, 0) <math>4x + 3y = 12</math> drawn</p> <p>(b) </p>		2	
13	$a^2 = 1 - \frac{b^2}{c^2}$ $c^2 a^2 = c^2 - b^2 \quad \text{OR} \quad \frac{b^2}{c^2} = 1 - a^2$ $\text{OR} \quad a^2 = \frac{c^2 - b^2}{c^2}$ $c^2 = \frac{b^2}{1 - a^2} \quad (\text{isolating } c^2)$ $c = \sqrt{\frac{b^2}{1 - a^2}} \quad (\text{oe})$		3	<p>M1</p> <p>M1 dep</p> <p>A1</p>

Qn	Working	Answer	Mark	Notes
14		$2x^2 + 7x + 4 = 0$	3	M1 correct coefficient 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 $\text{m/s}^2$
16	Number of boys possible is 15 Number of possible girls is 9 Each boy can be paired with 9 different girls $15 \times 9$	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

Qn	Working	Answer	Mark	Notes
18		300 and correct assumption	4	<p>M1 for partial working, e.g. <math>\frac{20}{8}</math> oe</p> <p>or 40% or <math>\frac{2}{5}</math> or <math>20 \div 8</math> or <math>\frac{8}{20}</math> seen</p> <p>M1 for complete method e.g. <math>\frac{120 \times 20}{8}</math> or <math>15 \times 20</math></p> <p>or <math>\frac{120}{n} = \frac{8}{20}</math> or <math>120 \div 0.4</math> oe</p> <p>A1 cao</p> <p>C1 for a correct mathematical assumption, e.g. mark does not wear off or sample is random or population has not changed, etc</p>

Qn	Working	Answer	Mark	Notes
19	<p>e.g. <math>\left(\frac{1}{8 \times 10^{9n}}\right)^{\frac{1}{3}}</math> <b>or</b> <math>(2 \times 10^{3n})^{-1}</math> <b>or</b></p> <p><math>\frac{1}{\sqrt[3]{8 \times 10^{9n}}}</math> <b>or</b> <math>(\sqrt[3]{8 \times 10^{9n}})^{-1}</math> <b>or</b></p> <p><math>(8^{\frac{-1}{3}} \times 10^{\frac{-9n}{3}})</math> <b>or</b></p> <p><math>\left[\frac{1}{8^{\frac{1}{3}}} \text{ and } \frac{1}{(10^{9n})^{\frac{1}{3}}}\right]</math> <b>or</b></p> <p><math>[2^{-1} \text{ and } (10^{3n})^{-1}]</math> oe</p> <p>e.g. <math>\frac{1}{2 \times 10^{3n}}</math> <b>or</b> <math>0.5 \times 10^{-3n}</math> <b>oe or</b></p> <p><math>\left[8^{\frac{-1}{3}} = 0.5 \text{ and } (10^{9n})^{\frac{-1}{3}} = 10^{-3n}\right]</math></p>	$5 \times 10^{-3n-1}$	3	<p>Correct first stage.</p> <p>For dealing with <math>8^{-\frac{1}{3}}</math> (shown as <math>\frac{1}{2}</math> or 0.5) and <math>(10^{9n})^{-\frac{1}{3}}</math> shown as <math>10^{-3n}</math></p> <p><math>5 \times 10^{-(3n+1)}</math></p>



Qn	Working	Answer	Mark	Notes
20	(a) $\frac{3}{6} \times \frac{3}{6}$	$\frac{9}{36}$	2	M1  A1 cao
	(b) $\frac{3}{6} \times \frac{3}{6}$  $\frac{1}{6} \times \frac{5}{6} + \frac{2}{6} \times \frac{3}{6}$  $\frac{1}{6} \times \frac{2}{6} + \frac{1}{6} \times \frac{3}{6} + \frac{2}{6} \times \frac{3}{6}$  $\frac{3}{6} \times \frac{3}{6} + \frac{1}{6} \times \frac{2}{6}$		3	M1  M1 for terms seen         A1

**Suggested grade boundaries**

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