

Practice Tests Set 23 – Paper 1H mark scheme

Question	Working	Answer	Mark	Notes
1	$6 - 12x$ or $2 - 4x = \frac{5}{3} - \frac{8}{3}x$		3	M1 for expansion of bracket on the LHS or dividing the RHS by 3 with two terms
	$6 - 5 = 12x - 8x$ or $1 = 4x$ or $-12x + 8x = 5 - 6$ oe or $-4x = -1$ or $\frac{8}{3}x - 4x = \frac{5}{3} - 2$ oe or $2 - \frac{5}{3} = -\frac{8}{3}x + 4x$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation; number terms on the other
	<i>Working required</i>	$\frac{1}{4}$		A1 oe dep on M1 awarded
				Total 3 marks

Question	Working	Answer	Mark	Notes
2			3	B3 Fully correct (B2 for 2 or 3 'regions' correct, B1 for one 'region' correct)
				Total 3 marks

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Question	Working	Answer	Mark	Notes	
3	eg $5x + 4y = -2$ $+ 8x - 4y = 17.6$ $(13x = 15.6)$ eg $[x = \frac{4.4 + y}{2}]$ oe $5\left(\frac{4.4 + y}{2}\right) + 4y = -2$ oe	eg $10x + 8y = -4$ $- 10x - 5y = 22$ $(13y = -26)$ eg $[y = 2x - 4.4]$ oe $5x + 4(2x - 4.4) = -2$ oe		3	M1 multiplication of one or both equation(s) with correct operation selected (allow one arithmetic error) (if + or – is not shown then assume it is the operation that at least 2 of the 3 terms have been calculated for) or correct rearrangement of one equation with substitution into second
	eg $5 \times "1.2" + 4y = -2$ or $2 \times "1.2" - y = 4.4$	eg $5x + 2 \times "-2" = 4.4$ or $2x - "-2" = 4.4$			M1 (dep on previous M1 but not on a correct first value) correct method to find second unknown – this could be a correct substitution into one of the equations given or calculated or starting again with the same style of working as for the first method mark
	<i>Working required</i>	$x = 1.2$ $y = -2$			A1 oe eg $x = \frac{6}{5}$ for both solutions dependent on first M1
					Total 3 marks

Question	Working	Answer	Mark	Notes	
4 (a)		$\frac{9}{10}$	1	B1 oe	
(b)		-6	1	B1	
					Total 2 marks

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Question	Working	Answer	Mark	Notes
5 (a)		$\frac{2}{9}, \frac{7}{9}$	2	B1 for correct probabilities for the first card Allow equivalent probabilities e.g 0.2
		$\frac{1}{8}, \frac{7}{8}, \frac{2}{8}, \frac{6}{8}$		B1 for correct probabilities for the second card Allow equivalent probabilities
(b)	$\frac{2}{9} \times \frac{1}{8}$ or $1 - \frac{2}{9} \times \frac{7}{8} - \frac{7}{9} \times \frac{2}{8} - \frac{7}{9} \times \frac{6}{8}$		2	M1ft (All probabilities must be less than 1)
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{1}{36}$		A1ft oe probability must be less than 1 Allow equivalent decimal to at least 2 sf (truncated or rounded) for $\frac{1}{36}$ (= 0.027(77..))
(c)	$\frac{2}{9} \times \frac{7}{8}$ or $\frac{7}{9} \times \frac{2}{8}$ oe or $\frac{2}{9} \times \frac{1}{8}$ and $\frac{7}{9} \times \frac{6}{8}$ oe or $\frac{1}{36}$ and $\frac{7}{9} \times \frac{6}{8}$ oe		3	M1ft (All probabilities must be less than 1)
	$\frac{2}{9} \times \frac{7}{8} + \frac{7}{9} \times \frac{2}{8}$ or $2 \times \frac{14}{72}$ oe or $1 - \frac{2}{9} \times \frac{1}{8} - \frac{7}{9} \times \frac{6}{8}$ oe or $1 - \frac{1}{36} - \frac{7}{9} \times \frac{6}{8}$ oe			M1ft
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{7}{18}$		A1ft oe probability must be less than 1 Allow equivalent decimal to at least 2 sf (truncated or rounded) for $\frac{7}{18}$ (= 0.38(88..))
				Total 7 marks

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Question	Working	Answer	Mark	Notes
6	$\frac{26}{7}, \frac{13}{8}$ oe		3	M1 both fractions expressed as improper fractions, no need for \div or \times may be equivalent to those given eg $\frac{52}{14}, \frac{26}{16}$ etc. A student could invert $\frac{13}{8}$ and show multiplication - as shown in the 2nd M1, this mark is then implied.
	$\frac{26}{7} \times \frac{8}{13}$ oe or eg $\frac{208}{56} \div \frac{91}{56}$			M1 or for both fractions expressed as equivalent fractions with denominators that are a common multiple of 7 and 8 eg $\frac{208}{56} \div \frac{91}{56}$
	eg $\frac{26}{7} \times \frac{8}{13} = \frac{208}{91} = \frac{16}{7} = 2\frac{2}{7}$ or $\frac{26}{7} \times \frac{8}{13} = \frac{208}{91} = 2\frac{26}{91} = 2\frac{2}{7}$ or $\frac{26^2}{7} \times \frac{8}{13^1} = \frac{16}{7} = 2\frac{2}{7}$ or $\frac{208}{56} \div \frac{91}{56} = \frac{208}{91} = \frac{16}{7} = 2\frac{2}{7}$ or correct working to $\frac{16}{7}$ and writing $2\frac{2}{7} = \frac{16}{7}$ (usually on the first line of working) <i>working required</i>	shown		A1 dep on M2 NB: use of decimals scores no marks (unless used as a check)
				Total 3 marks

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Question	Working	Answer	Mark	Notes
7 (a)		1	1	B1
(b)		$27a^6b^{12}$	2	B2 (B1 for 2 of 3 parts in a product)
(c)		$7x^2y^2(2y^2 + 3x)$	2	B2 B1 for a correct factorisation with at least 2 factors outside (eg $7x$, x^2 , xy , etc) eg $7x(2xy^4 + 3x^2y^2)$ eg $x^2y^2(14y^2 + 21x)$ or for the correct common factor with just one mistake inside the bracket eg $7x^2y^2(2y + 3x)$ which is missing the squared on the y term
(d)	<p>$y = mx + 4$ where $m \neq 0$ oe (eg $y = 2x + 4$)</p> <p>or</p> <p>$y = -2x + c$ or $y + 2x = c$ oe</p> <p>or</p> <p>$-2x + 4$ or $f(x) = -2x + 4$ oe</p>		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$y = -2x + 4$		A1 oe eg $y + 2x = 4$
				Total 7 marks

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Question	Working	Answer	Mark	Notes
8	$(54 - 24) \div 2 (=15)$ [may be marked on diagram]		5	M1
	$"15" - (24 \div 2)^2 (= 81)$			M1 ft their "15" (if > 12)
	[height =] $\sqrt{"15" - (24 \div 2)^2} (= 9)$			M1 ft their "15" (if > 12)
	$(24 \times "9") \div 2$ oe			M1 figures must be from correct working
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	108		A1 allow 107.9 – 108.1
	ALTERNATIVES BELOW			Total 5 marks
	$(54 - 24) \div 2 (=15)$ [may be marked on diagram]		5	M1
	<p>or $x = \cos^{-1}\left(\frac{"12"}{"15"}\right) (= 36.86\dots)$</p> <p>or $y = \sin^{-1}\left(\frac{24 \div 2}{"15"}\right) (= 53.13\dots)$</p> <p>or $A = \cos^{-1}\left(\frac{15^2 + 15^2 - 24^2}{2 \times 15 \times 15}\right) (= 106.2\dots)$</p> <p>or $B = \cos^{-1}\left(\frac{15^2 + 24^2 - 15^2}{2 \times 15 \times 24}\right) (= 36.8\dots)$</p>			<p>M1 ft their "15" (if > 12)</p> <p>[using Hero's formula $S = 0.5 \times 54 (= 27)$ and] $27 \times (27 - 24) \times (27 - "15") \times (27 - "15")$</p>
	<p>or "12"tan"36.86..." (= 9) (allow 8.9... for these)</p> <p>"12" ÷ tan"53.13..." (= 9)</p> <p>or "15" × sin "36.86..." (= 9)</p> <p>or "15" × cos "53.13..." (= 9)</p>			<p>M1 ft their "15" (if > 12)</p> <p>M2 for $0.5 \times 24 \times "15" \times \sin"36.86\dots"$ or $0.5 \times "15" \times "15" \times \sin(2 \times "53.13\dots")$ or $0.5 \times "15" \times "15" \times \sin("106.2\dots")$ or $\sqrt{"27"("27" - 24)("27" - "15")("27" - "15")}$</p>
	$(24 \times "9") \div 2$ oe			M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	108		A1 allow 107.9 – 108.1
				Total 5 marks

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Question	Working	Answer	Mark	Notes																
9 (a)		43.5 - 44.5	1	B1 ± 0.5 small square																
(b)	eg reading of 48 - 49		2	M1 For correct method to start the question eg a vertical line from 55 up to the line and a horizontal line from the correct point on the curve or a mark on the curve at the correct point and a mark on the vertical axis at the correct point or a correct reading of 48 to 49																
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	11 or 12		A1 Allow an answer of 11 or 12 (ie must be whole number)																
(c)	<table border="1"> <thead> <tr> <th>Time taken to shop in the market (m minutes)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < m \leq 10$</td> <td>3</td> </tr> <tr> <td>$10 < m \leq 20$</td> <td>5</td> </tr> <tr> <td>$20 < m \leq 30$</td> <td>7</td> </tr> <tr> <td>$30 < m \leq 40$</td> <td>10</td> </tr> <tr> <td>$40 < m \leq 50$</td> <td>15</td> </tr> <tr> <td>$50 < m \leq 60$</td> <td>15</td> </tr> <tr> <td>$60 < m \leq 70$</td> <td>5</td> </tr> </tbody> </table>	Time taken to shop in the market (m minutes)	Frequency	$0 < m \leq 10$	3	$10 < m \leq 20$	5	$20 < m \leq 30$	7	$30 < m \leq 40$	10	$40 < m \leq 50$	15	$50 < m \leq 60$	15	$60 < m \leq 70$	5		2	B2 All values correctly filled in (NB: first 2 are already completed) (B1 for 3 or 4 correct values from 7, 10, 15, 15, 5)
Time taken to shop in the market (m minutes)	Frequency																			
$0 < m \leq 10$	3																			
$10 < m \leq 20$	5																			
$20 < m \leq 30$	7																			
$30 < m \leq 40$	10																			
$40 < m \leq 50$	15																			
$50 < m \leq 60$	15																			
$60 < m \leq 70$	5																			
				Total 5 marks																

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Qn	Working	Answer	Notes
10	$3x(2x-5) = 6x^2 - 15x$ or		3 M1 for multiplying $3x$ by $(2x - 5)$ with both terms correct or for multiplying $(2x - 5)$ by $(2x - 5)$ with 3 out of 4 terms correct or for multiplying $(2x - 5)$ by $(2x - 5)$ and getting $4x^2 - 20x \dots$ or $\dots -20x + 25$ (not for $4x^2 + 25$)
	$(2x-5)^2 = 4x^2 - 10x - 10x + 25$ or		
	$(2x-5)^2 = 4x^2 - 20x + 25$		
	$(6x^2 - 15x)(2x - 5) = 12x^3 - 30x^2 - 30x^2 + 75x$ oe or		M1ft (dep) for multiplying the product of $3x$ and $(2x - 5)$ by $(2x - 5)$ with 3 out of 4 terms correct or for multiplying the product of $3x$ and $(2x - 5)$ by $(2x - 5)$ and getting $12x^3 - 60x^2 \dots$ or $\dots -60x^2 + 75x$ for multiplying the product of $(2x - 5)$ and $(2x - 5)$ by $3x$ with 3 out of 4 terms correct or for multiplying the product of $(2x - 5)$ and $(2x - 5)$ by $3x$ with 2 out of 3 terms correct or Expansion in one stage will lead to $12x^3 - 30x^2 - 30x^2 + 75x$ without firstly expanding two factors – award M2 for 3 out of 4 terms correct M1 for 2 out of 4 terms correct
	$(6x^2 - 15x)(2x - 5) = 12x^3 - 60x^2 + 75x$ oe or		
	$3x(4x^2 - 10x - 10x + 25) = 12x^3 - 30x^2 - 30x^2 + 75x$ oe or		
	$3x(4x^2 - 20x + 25) = 12x^3 - 60x^2 + 75x$		
	<i>Working required</i>	$12x^3 - 60x^2 + 75x$	A1 dep on M1
			Total 3 marks

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Question	Working	Answer	Mark	Notes
11	Two pairs of intersecting arcs with equal radii centre <i>A</i> and <i>B</i>		2	M1 for arcs that intersect within or on the guidelines or correct perpendicular bisector without arcs.
	<i>Working required</i>	Bisector with construction arcs		A1 for a fully correct bisector with two intersecting arcs
				Total 2 marks

Question	Working	Answer	Mark	Notes
12		B	3	B1
		A		B1
		F		B1
				Total 3 marks

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	Working	Answer	M	Notes
13	$x^2 + (7 - 2x)^2 = 34$	$\left(\frac{7-y}{2}\right)^2 + y^2 = 34$	5	M1 substitution of linear equation into quadratic
	$5x^2 - 28x + 15 [= 0]$ oe	$5y^2 - 14y - 87 [= 0]$ oe		M1 dep on previous M1 for multiplying out and collecting terms, forming a three term quadratic in any form of $ax^2 + bx + c (= 0)$ where at least 2 coefficients (a or b or c) are correct and all are non-zero
	$(5x - 3)(x - 5) [= 0]$ or $\frac{-(-28) \pm \sqrt{(-28)^2 - 4 \times 5 \times 15}}{2 \times 5}$ or $5\left[x - \frac{28}{10}\right]^2 - \frac{784}{100} + 15 = 0$ oe or $x = 0.6$ and $x = 5$ (allow incorrect labels for x/y)	$(5y - 29)(y + 3) [= 0]$ or $\frac{-(-14) \pm \sqrt{(-14)^2 - 4 \times 5 \times (-87)}}{2 \times 5}$ or $5\left[y - \frac{14}{10}\right]^2 - \frac{196}{100} - 87 = 0$ oe or $y = 5.8$ and $y = -3$ (allow incorrect labels for x/y)		M1ft dep on M1 for solving <i>their</i> 3 term quadratic equation using any correct method (if factorising, allow brackets which expanded give 2 out of 3 terms correct) (if using formula allow one sign error and some simplification – allow as far as $\frac{28 \pm \sqrt{784 - 300}}{10}$ or $\frac{14 \pm \sqrt{196 + 1740}}{10}$) (if completing the square allow as far as shown) or correct values for x or correct values for y dep on correct quadratic
	eg $y = 7 - 2 \times 5$ and $y = 7 - 2 \times 0.6$ (correct labels for x/y)	eg $5.8 = 7 - 2x$ and $-3 = 7 - 2x$ (correct labels for x/y)		M1ft dep on previous M1 for substituting their 2 found values of x or y in a suitable equation or correct values for the other variable
	<i>Working must be shown</i>	$x = 0.6, y = 5.8$ $x = 5, y = -3$	A1	dep on M1 and the correct quadratic (allow coordinates) must be paired correctly
				Total 5 marks

Question	Working	Answer	Mark	Notes
14	eg $1000x = 438.38\dots$ $\underline{10x = 4.38\dots}$ or $100x = 43.838\dots$ $\underline{x = 0.438\dots}$ oe		2	M1 For selecting 2 correct recurring decimals that when subtracted give a whole number or terminating decimal (43.4 or 434 etc) eg $1000x = 438.38\dots$ and $10x = 4.38\dots$ or $100x = 43.838\dots$ and $x = 0.438\dots$ with intention to subtract. (if recurring dots not shown then showing at least one of the numbers to at least 5sf) or $0.4 + 0.0\dot{3}\dot{8}$ and eg $1000x = 38.38\dots$ & $10x = 0.3838\dots$, with intention to subtract.
	eg $1000x - 10x = 438.38\dots - 4.38\dots = 434$ and $\frac{434}{990} = \frac{217}{495}$ or eg $100x - x = 43.838\dots - 0.438\dots = 43.4$ and $\frac{43.4}{99} = \frac{217}{495}$ or eg $1000x - 10x = 38.38\dots - 0.3838 = 38$ and $0.4 + \frac{38}{990} = \frac{4 \times 99 + 38}{990} = \frac{434}{990} = \frac{217}{495}$ oe working required	Clearly shown		A1 For completion to $\frac{217}{495}$ dep on M1 and use of some algebra
				Total 2 marks

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Question	Working	Answer	Mark	Notes
15	$y = \frac{k}{\sqrt{x}}$ or $ky = \frac{1}{\sqrt{x}}$ or $\sqrt{x} = \frac{k}{y}$ oe		3	M1 (NB. Not for $y = \frac{1}{\sqrt{x}}$) Constant of proportionality must be a symbol such as k (Allow c for k for this mark only)
	$c^4 = \frac{k}{\sqrt{c^2}}$ oe or $k = c^4 \times \sqrt{c^2}$ oe			M1 for substitution of x and y into a correct formula
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$y = \frac{c^5}{\sqrt{x}}$		A1 oe e.g $y = c^5 \times \frac{1}{\sqrt{x}}$ Award 3 marks if answer is $y = \frac{k}{\sqrt{x}}$ on the answer line and $k = c^5$ clearly given in the body of working of the script
				Total 3 marks

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Question	Working	Answer	Mark	Notes
16	$(6x - 5)(x + 7) = 0$ or $\frac{-37 \pm \sqrt{37^2 - 4 \times 6 \times -35}}{2 \times 6}$ $6 \left[\left(x + \frac{37}{12} \right)^2 - \left(\frac{37}{12} \right)^2 \right] \dots$ oe		3	M1 A correct method to solve the quadratic equation $6x^2 + 37x - 35 = 0$ using any correct method (if factorising, allow brackets which expanded give 2 out of 3 terms correct) (if using formula allow one sign error in substitution and some simplification – allow as far as $\frac{-37 \pm \sqrt{1369 + 840}}{12}$) or completing the square as far as shown on left
	$\frac{5}{6}$ oe and -7			A1 dep on M1 correct critical values (allow 0.83...)
	<i>Working must be seen for both accuracy marks as asked for in question</i>	$-7 \leq x \leq \frac{5}{6}$		A1 dep on M1 oe eg $-7 \leq x \leq 0.83\dots$, $\left[-7, \frac{5}{6} \right]$ Accept $x \leq \frac{5}{6}, x \geq -7$
				Total 3 marks

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Question	Working	Answer	Mark	Notes
17 (a)		12	1	B1
(b)	$\frac{5-\sqrt{18}}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}}$ or $\frac{5-\sqrt{18}}{1-\sqrt{2}} \times \frac{-1-\sqrt{2}}{-1-\sqrt{2}}$ oe		3	M1 Multiplying numerator and denominator by $1+\sqrt{2}$
	$\frac{5-\sqrt{36}+5\sqrt{2}-\sqrt{18}}{1+\sqrt{2}-\sqrt{2}-2}$ or $\frac{5-6-3\sqrt{2}+5\sqrt{2}}{-1}$ or $\frac{-5+6+3\sqrt{2}-5\sqrt{2}}{1}$ oe NB:allow $\sqrt{18}$ or $3\sqrt{2}$ $\sqrt{36}$ or 6 or $\sqrt{6}\sqrt{6}$			M1 Showing correct expansions (not necessarily as a fraction)
	<i>working required</i>	$1-2\sqrt{2}$		A1 dep on M2 (ie all stages of working must be shown convincingly) or for stating $a = 1$ and $b = -2$
				Total 4 marks

Question	Working	Answer	Mark	Notes
18 (a)		$\frac{k}{x}$	1	B1 allow kx^{-1}
(b)(i)		-46	1	B1 cao
(ii)	$\frac{3(2-3x^4)}{2-(2-3x^4)}$ or $\frac{6-9x^4}{2-2+3x^4}$ oe or $\frac{6-9x^4}{3x^4}$ oe		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{2-3x^4}{x^4}$		A1 allow $\frac{2}{x^4} - 3$ oe
				Total 4 marks

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Question	Working	Answer	Mark	Notes
19 (a)(i)		140	1	B1
(a)(ii)		<u>opposite angles</u> of a <u>cyclic quadrilateral</u> (add to 180°) oe	1	B1 dep on B1 in (a)(i) or seeing 180 – 40 with no contradiction oe eg <u>angle at centre</u> is <u>double (2 ×)</u> angle at <u>circumference</u> oe AND <u>angles around a point</u> (or <u>point 360</u>)
(b)	$ADB = 66$ or $ABO = 90 - 66 (=24)$ or $BAO = 90 - 66 (=24)$ or $ODB = \frac{180-80}{2} (= 50)$ or DOB reflex = 280		3	M1 Clearly labelled in working or shown on diagram
	For 2 of: $ADB = 66$ or $ABO = 90 - 66 (=24)$ or $BAO = 90 - 66 (=24)$ or $ODB = \frac{180-80}{2} (= 50)$ DOB reflex = 280			M1 (award M2 for $360 - (280 + 40 + 24)$)oe
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	16		A1
				Total 5 marks

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Question	Working	Answer	Mark	Notes
20		$2x + y \leq 6$ $2y \leq 5x + 1$ $3y + 2x \geq 4$	3	B3 oe for all three correct (B2 oe for any two correct) (B1 oe for any one correct) $2x + y \leq 6$ equivalent to $y \leq -2x + 6$ oe $2y \leq 5x + 1$ equivalent to $y \leq 2.5x + 0.5$ oe $3y + 2x \geq 4$ equivalent to $y \geq -\frac{2}{3}x + \frac{4}{3}$ oe Allow the following inequalities $2x + y < 6$ oe $2y < 5x + 1$ oe $3y + 2x > 4$ oe
				Total 3 marks

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Question	Working	Answer	Mark	Notes
21	e.g. $(\overline{AB} =) 2\mathbf{b} - 2\mathbf{a}$ oe or $(\overline{BA} =) 2\mathbf{a} - 2\mathbf{b}$ oe or $(\overline{BD} =) 2(2\mathbf{b} - 2\mathbf{a})(= 4\mathbf{b} - 4\mathbf{a})$ oe or $(\overline{AD} =) 3(2\mathbf{b} - 2\mathbf{a})(= 6\mathbf{b} - 6\mathbf{a})$ oe		5	M1
	e.g. $(\overline{OE} =) 2\mathbf{b} + 2(2\mathbf{b} - 2\mathbf{a}) + 7\mathbf{a} + 3\mathbf{b} (= 3\mathbf{a} + 9\mathbf{b})$ oe or $(\overline{OC} =) 2\mathbf{a} + \lambda(2\mathbf{b} - 2\mathbf{a}) = (2 - 2\lambda)\mathbf{a} + 2\lambda\mathbf{b}$ oe or $2\mathbf{b} + \lambda(2\mathbf{a} - 2\mathbf{b})$ or $(\overline{CE} =) (2\mathbf{b} - 2\mathbf{a}) - \lambda(2\mathbf{b} - 2\mathbf{a}) + 2(2\mathbf{b} - 2\mathbf{a}) + 7\mathbf{a} + 3\mathbf{b} = (1 + 2\lambda)\mathbf{a} + (9 - 2\lambda)\mathbf{b}$			M2 for 2 correct paths seen M1 for 1 correct path seen Any correct path for <i>OC</i> passing through <i>A</i> or <i>B</i> involving a variable
	e.g. $\frac{2 - 2\lambda}{2\lambda} = \frac{1 + 2\lambda}{9 - 2\lambda}$ oe or $\frac{2 - 2\lambda}{2\lambda} = \frac{3}{9}$ oe or $\frac{(1 + 2\lambda)}{(9 - 2\lambda)} = \frac{1}{3}$ oe or $\lambda = \frac{3}{4}$ or $(2 - 2\lambda)\mathbf{a} + 2\lambda\mathbf{b} = \mu(3\mathbf{a} + 9\mathbf{b})$ or $\lambda = \frac{3}{4}$ or $\mu = \frac{1}{6}$ or $2\mathbf{b} + \lambda(2\mathbf{a} - 2\mathbf{b}) = \mu(3\mathbf{a} + 9\mathbf{b})$ or $\lambda = \frac{1}{4}$ or $\mu = \frac{5}{6}$			M1 for comparing coefficients of a and b for (<i>OC</i> and <i>CE</i>) or (<i>OC</i> and <i>OE</i>) or (<i>CE</i> and <i>OE</i>) <i>OC</i> is a multiple of <i>OE</i> Two different paths for <i>OC</i>
		1 : 5		A1 dep M2 oe e.g 2 : 10
	<i>Working required</i>			Total 5 marks

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21 ALT	e.g. $(\overline{AB} =) 2\mathbf{b} - 2\mathbf{a}$ oe or $(\overline{BA} =) 2\mathbf{a} - 2\mathbf{b}$ oe or $(\overline{BD} =) 2(2\mathbf{b} - 2\mathbf{a})(= 4\mathbf{b} - 4\mathbf{a})$ oe or $(\overline{AD} =) 3(2\mathbf{b} - 2\mathbf{a})(= 6\mathbf{b} - 6\mathbf{a})$ oe		5	M1
	e.g. $(\overline{OE} =) 2\mathbf{b} + 2(2\mathbf{b} - 2\mathbf{a}) + 7\mathbf{a} + 3\mathbf{b} (= 3\mathbf{a} + 9\mathbf{b})$ oe			M1
	e.g. $(\overline{AE} =) 2\mathbf{b} - 2\mathbf{a} + 2(2\mathbf{b} - 2\mathbf{a}) + 7\mathbf{a} + 3\mathbf{b} (= \mathbf{a} + 9\mathbf{b})$ oe			M1
	$[\overline{AE} = \lambda \overline{AD} + \mu \overline{OE}]$ $\mathbf{a} + 9\mathbf{b} = \lambda(6\mathbf{b} - 6\mathbf{a}) + \mu(3\mathbf{a} + 9\mathbf{b})$ oe or $1 = -6\lambda + 3\mu$ oe and $9 = 6\lambda + 9\mu$ oe or or $\lambda = \frac{1}{4}$ or $\mu = \frac{5}{6}$			M1
		1 : 5		A1 dep on M2 oe e.g 2 : 10
	<i>Working required</i>			Total 5 marks

Practice Tests Set 23 – Paper 1H mark scheme

Qn	Skill tested				Edexcel averages: scores of candidates who achieved grade:								
		Mean score	Max score	Mean %	ALL	9	8	7	6	5	4	3	U
1	Linear equations	2.52	3	84	2.52	2.96	2.92	2.86	2.76	2.45	2.01	1.38	0.57
2	Set language and notation	2.44	3	81	2.44	2.94	2.83	2.68	2.56	2.36	1.90	1.46	0.79
3	Simultaneous linear equations	2.17	3	72	2.17	2.95	2.83	2.68	2.32	1.80	1.30	0.49	0.07
4	Powers and roots	1.50	2	75	1.50	1.88	1.79	1.72	1.59	1.40	1.15	0.73	0.25
5	Probability	4.49	7	64	4.49	6.80	6.43	5.91	4.67	3.03	1.39	0.46	0.12
6	Fractions	2.18	3	73	2.18	2.76	2.68	2.52	2.28	1.91	1.47	1.14	0.61
7	Powers and roots	4.57	7	65	4.57	6.74	6.17	5.46	4.42	3.31	2.30	1.36	0.55
8	Mensuration of 2D shapes	3.05	5	61	3.05	4.84	4.5	4.02	2.98	1.64	0.87	0.37	0.18
9	Graphical representation of data	3.2	5	64	3.2	4.58	4.14	3.59	3.14	2.68	1.83	0.98	0.55
10	Algebraic manipulation	1.74	3	58	1.74	2.76	2.55	2.12	1.66	1.13	0.59	0.27	0.05
11	Construction	1.08	2	54	1.08	1.72	1.51	1.27	0.94	0.72	0.50	0.19	0.08
12	Calculus	1.58	3	53	1.58	2.72	2.11	1.68	1.17	0.86	0.71	0.64	0.43
13	Quadratic equations	2.35	5	47	2.35	4.71	3.87	2.65	1.51	0.72	0.28	0.07	0.01
14	Applying number	0.92	2	46	0.92	1.82	1.45	1.02	0.66	0.32	0.13	0.03	0.00
15	Proportion	1.19	3	40	1.19	2.54	1.85	1.29	0.69	0.35	0.13	0.05	0.01
16	Inequalities	1.10	3	37	1.10	2.40	1.77	1.11	0.61	0.26	0.12	0.03	0.00
17	Powers and roots	1.54	4	39	1.54	3.43	2.31	1.42	0.89	0.48	0.18	0.06	0.05
18	Function notation	1.43	4	36	1.43	3.00	2.06	1.39	0.97	0.56	0.22	0.14	0.07
19	Circle properties	1.8	5	36	1.8	3.9	2.68	1.72	1.05	0.62	0.23	0.05	0.03
20	Inequalities	1.00	3	33	1.00	2.45	1.54	0.77	0.44	0.19	0.04	0.04	0.00
21	Vectors	0.94	5	19	0.94	2.71	1.23	0.54	0.18	0.09	0.01	0.00	0.00
		42.79	80	53	42.79	70.61	59.22	48.42	37.49	26.88	17.36	9.94	4.42

Suggested grade boundaries

Grade	9	8	7	6	5	4	3
Mark	65	54	43	32	22	14	7