Practice Tests Set 24 – Paper 1H mark scheme

Qn	Working	Answer	Mark		Notes
1	eg $4x + 8y = 60$ or $3x + 6y = 45$ $-\ \underline{4x - 6y = 4}$ $+\ \underline{4x - 6y = 4}$ $(14y = 56)$ $(7x = 49)$ eg $4x - 6\left(\frac{15 - x}{2}\right) = 4$ or $4(15 - 2y) - 6y = 4$ oe		3	M1	Correct method to eliminate x or y: coefficients of x or y the same **and** correct operator to eliminate selected variable (condone any one arithmetic error in multiplication) **or** correctly writing x or y in terms of the other variable and correctly substituting.
	eg $x + 2 \times 4 = 15$ or $7 + 2 \times y = 15$			M1	dep correct method to find second variable using their value from a correct method to find first variable or for repeating above method to find second variable.
	Working required	$x = 7$, $y = 4$		A1	dep on M1
					Total 3 marks

Qn		Working	Answer	Mark		Notes
2	(b) (i)	eg $(y \pm 6)(y \pm 3)$ or $y(y + 3) - 6(y + 3)$ or $y(y - 6) + 3(y - 6)$		2	M1	or $(y + a)(y + b)$ where $ab = -18$ **or** $a + b = -3$ or factorisation which expands to give 2 out of 3 correct terms
		[allow use of x rather than y]	$(y - 6)(y + 3)$		A1	
	(ii)		$6, -3$	1	B1	ft must come from their factors in (b)(i)
						Total 3 marks

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Qn	Working	Answer	Mark	Notes
3	<table><tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>10</td><td>7.5</td><td>5</td><td>2.5</td><td>0</td><td>−2.5</td><td>−5</td></tr></table>	Correct line	3	B3 for a correct line between $x = -2$ and $x = 4$ If not B3 then award B2 for a line segment through at least 3 of (−2, 10), (−1, 7.5), (0, 5), (1, 2.5), (2, 0), (3, −2.5), (4, −5) **or** all points plotted correctly If not B2 then award B1 for at least 2 correct points plotted or stated (may be seen in a table) **or** for a line drawn with a negative gradient through (0, 5) **or** for a line with a gradient of −2.5
				Total 3 marks

Qn	Working	Answer	Mark	Notes
4 (a)		2	1	B1
(b)		$8a^3$	2	B2 for $8a^3$ If not B2 then B1 for $8a^k$ where $k \neq 3$ or ka^3 where $k \neq 8$
				Total 3 marks

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Qn	Working	Answer	Mark	Notes
5 (a)		$3c^2(6cd^2-7)$	2	B2 fully correct **or** B1 for a correct partial factorisation with at least two terms outside the bracket ie $3c(6c^2d^2-7c)$ or $c^2(18cd^2-21)$ **or** the fully correct factor outside the bracket with two terms inside the bracket and at most one mistake $3c^2(.....)$
				Total 2 marks

Qn	Working	Answer	Mark	Notes
6		(x =) 3	3	B1
		(y =) 6		B1
		(z =) 10		B1
				Total 3 marks

Qn	Working	Answer	Mark	Notes
7 (c)	$5x(3x + 4) = 15x^2 + 20x$ **or** $5x(2x - 1) = 10x^2 - 5x$ **or** $(3x + 4)(2x - 1) = 6x^2 - 3x + 8x - 4$ $(= 6x^2 + 5x - 4)$		3	M1 for a correct intention to multiply all 3 factors by multiplying 2 factors only, allow one error
	$(15x^2 + 20x)(2x - 1) = 30x^3 - 15x^2 + 40x^2 - 20x$ oe $(10x^2 - 5x)(3x + 4) = 30x^3 + 40x^2 - 15x^2 - 20x$ oe $5x(6x^2 + 5x - 4) = 30x^3 + 25x^2 - 20x$ oe			M1 (dep)ft for expanding by the third factor, allow one error (some may do the expansion in one stage and will get to $30x^3 - 15x^2 + 40x^2 - 20x$ without firstly expanding two factors – this gains M2, allow one error)
	Correct answer scores full marks (unless from obvious incorrect working)	$30x^3 + 25x^2 - 20x$		A1 isw correct factorisation ($30x^3 + 25x^2 - 20x$ must be seen previously to award 3 marks) eg $5(6x^3 + 5x^2 - 4x)$ $x(30x^2 + 25x - 20)$ $5x(6x^2 + 5x - 4)$ do not isw incorrect simplification eg $30x^3 + 25x^2 - 20x = 6x^3 + 5x^2 - 4x$ gets M2A0
				Total 3 marks

Qn	Working	Answer	Mark	Notes
8	$2^{-4x} = 2^5$ or $-4x = 5$ or $-\frac{4}{5}x = 1$ oe		2	M1
	Correct answer scores full marks (unless from obvious incorrect working)	$-\frac{5}{4}$		A1 oe allow eg $\frac{5}{-4}$
				Total 2 marks

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Qn		Working	Answer	Mark	Notes
9	(a)		0.000 0932	1	B1
	(b)		2.4×10^{5}	2	B2 If not B2, then B1 for 240 000 or 24×10^{4} oe or 2.4×10^{a} $a\neq5$
	(c)		1.8×10^{121}	2	B2 If not B2, then B1 for 18×10^{120} or 1.8×10^{b} $b\neq121$
					Total 5 marks

Qn	Working	Answer	Mark	Notes
10	eg $\frac{14}{3}$ **and** $\frac{11}{6}$		3	M1 for both mixed numbers expressed as improper fractions
	eg $\frac{14}{3}\times\frac{6}{11}$ **or** $\frac{28}{6}\div\frac{11}{6}$ **or** $\frac{28n}{6n}\div\frac{11n}{6n}$			M1 seeing this stage gains M2
	eg $\frac{14}{3}\times\frac{6}{11}=\frac{84}{33}=\frac{28}{11}=2\frac{6}{11}$ **or** $\frac{14}{3}\times\frac{6}{11}=\frac{84}{33}=2\frac{18}{33}=2\frac{6}{11}$ **or** $\frac{14}{\cancel{3}^{1}}\times\frac{\cancel{6}^{2}}{11}=\frac{28}{11}=2\frac{6}{11}$ **or** $\frac{14}{3}\div\frac{11}{6}=\frac{28}{6}\div\frac{11}{6}=\frac{28}{11}=2\frac{6}{11}$ **or** correct working to $\frac{28}{11}$ **and** writing $2\frac{6}{11}=\frac{28}{11}$ *Working required*	Shown		A1 dep on M2 for conclusion to $2\frac{6}{11}$ from correct working – either sight of result of multiplication eg $\frac{84}{33}$ must be seen or correct cancelling to $\frac{28}{11}$ or complete method using division and common denominators
				Total 3 marks

Qn		Working	Answer	Mark		Notes
11	(a)		Triangle drawn at (−1, −3) (−1, −4) (−3, −3)	2	B2	for a correct triangle with correct orientation and position If not B2 then award B1 for a correct triangle drawn with correct orientation in wrong position or triangle drawn with 2 out of 3 correct vertices
	(b)		Triangle drawn at (−4, 4) (−4, 5) (−2, 4)	1	B1	cao
						Total 3 marks

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Qn		Working	Answer	Mark	Notes
12	(a)		–0.5	1	B1 oe eg $-\frac{1}{2}, \frac{-1}{2}, \frac{1}{-2}, -1/2$
	(b)	$(3x-5)y=2$ **or** $(3y-5)x=2$ **or** $3xy-5y=2$ **or** $3xy-5x=2$ oe or $3y-5=\frac{2}{x}$ **or** $3x-5=\frac{2}{y}$ oe		2	M1 remove denominator or get to the stage $3y-5=\frac{2}{x}$ or $3x-5=\frac{2}{y}$
		Correct answer scores full marks (unless from obvious incorrect working)	$\frac{2+5x}{3x}$		A1oe eg $\frac{2}{3x}+\frac{5}{3}$ or $\frac{\frac{2}{x}+5}{3}$ **must be in terms of *x***
	(c)	$5\left(x^2-4x\right)$.....**or** $5\left(x^2-4x.....\right)$**or** $5(x-2)^2\ldots$		3	M1
		$5\left[(x-2)^2-(-2)^2\right]$.....**or** $5\left[(x-2)^2-(-2)^2.....\right]$ **or** $5(x-2)^2-20$ ……. **or** $5\left[(x-2)^2+\frac{3}{5}\right]$			M1 $(-2)^2$ can be 2^2 or 4 or $\left(\pm\frac{4}{2}\right)^2$
		Correct answer scores full marks (unless from obvious incorrect working)	$5(x-2)^2+3$		A1
					Total 6 marks
Alternative mark scheme for 12(c)					
		$ax^2-2abx+ab^2+c$		3	M1 for multiplying out $a(x-b)^2+c$ to obtain $ax^2-2abx+ab^2+c$ oe
		2 of: $a=5$ $2ab=20$ oe $ab^2+c=23$ oe			M1 for equating coefficients and making 2 correct statements
			$5(x-2)^2+3$		A1

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Qn	Working	Answer	Mark	Notes
13	eg $-\begin{pmatrix}-5\\4\end{pmatrix}+\begin{pmatrix}9\\1\end{pmatrix}$ **or** $\begin{pmatrix}5\\-4\end{pmatrix}+\begin{pmatrix}9\\1\end{pmatrix}$ **or** $\begin{pmatrix}14\\a\end{pmatrix}$ $a \neq -3$ **or** $\begin{pmatrix}b\\-3\end{pmatrix}$ $b \neq 14$		2	M1 or an answer of $\begin{pmatrix}-14\\3\end{pmatrix}$
	Correct answer scores full marks (unless from obvious incorrect working)	$\begin{pmatrix}14\\-3\end{pmatrix}$		A1
				Total 2 marks

Qn		Working	Answer	Mark	Notes
14	(a)		$-3, -2, -1, 0, 1$	2	B2 for $-3, -2, -1, 0, 1$ If not B2 then award B1 for 4 correct values and no incorrect values (eg $-3, -2, -1, 0$) **or** for 6 values with no more than one incorrect value (eg $-4, -3, -2, -1, 0, 1$)
	(b)		$x > -1$	1	B1 accept $-1 < x$
					Total 3 marks

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Qn	Working		Answer	Mark		Notes
15	eg $2(-3-2x)^2+x^2=-6x+42$	eg $2y^2+\left(\frac{-3-y}{2}\right)^2=-6\left(\frac{-3-y}{2}\right)+42$		5	M1	substitution of $y=\pm3\pm2x$ (or $x=\frac{\pm3\pm y}{2}$) into $2y^2+x^2=-6x+42$ to obtain an equation in x only (or y only)
	eg $9x^2+30x-24(=0)$ **or** $3x^2+10x-8(=0)$ allow eg $3x^2+10x=8$	eg $\frac{9}{4}y^2-\frac{3}{2}y-\frac{195}{4}(=0)$ **or** $9y^2-6y-195(=0)$ **or** $3y^2-2y-65(=0)$ allow eg $3y^2-2y=65$			M1 ft	(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
	eg $(3x-2)(x+4)(=0)$ **or** $\frac{-10\pm\sqrt{10^2-4\times3\times-8}}{2\times3}$ **or** $3\left[\left(x+\frac{5}{3}\right)^2-\left(\frac{5}{3}\right)^2\right]=8$ oe (should give $(x=)\frac{2}{3}, -4$)	eg $(3y+13)(y-5)(=0)$ **or** $\frac{2\pm\sqrt{(-2)^2-4\times3\times-65}}{2\times3}$ **or** $3\left[\left(y-\frac{1}{3}\right)^2-\left(\frac{1}{3}\right)^2\right]=65$ oe (should give $(y=)-\frac{13}{3}, 5$)			M1 ft	(dep on M1) method to solve **their** 3 term quadratic using any correct method (allow one sign error and some simplification – allow as far as eg $\frac{-10\pm\sqrt{100+96}}{6}$ **or** $\frac{2\pm\sqrt{4+780}}{6}$) **or** if factorising allow brackets which expanded give 2 out of 3 terms correct)**or** correct values for x (allow 0.66(6…) or 0.67) **or** correct values for y (allow −4.33(3…))
	eg $2\left("\frac{2}{3}"\right)+y=-3$ **and** $2("-4")+y=-3$	eg $2x+"-\frac{13}{3}"=-3$ **and** $2x+"5"=-3$			M1	(dep on previous M1) for substituting **their** 2 found values of x or y in a suitable equation (use 2dp or better for substitution) **or** fully correct values for the other variable (correct labels for x / y)
	Working required		$x=-4, y=5$ and $x=\frac{2}{3}, y=-\frac{13}{3}$		A1	oe (dep on M1) and a correct quadratic (allow coordinates) allow $x=0.66(6\ldots)$ or 0.67, $y=-4.33(3\ldots)$, $x=-4$, $y=5$
						Total 5 marks

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Qn	Working	Answer	Mark		Notes
16	eg 10 000x = 3818.18…_ 100x = 38.18… **or** 1000x = 381.818…_ 10x = 3.818… **or** 100x = 38.1818…_ x = 0.3818… oe		2	M1	For **selecting** 2 correct recurring decimals that when subtracted give a whole number or terminating decimal (37.8 or 378 or 3780 etc) eg 10 000x = 3818.18... and 100x = 38.1818.... **or** 1000x = 381.818… and 10x = 3.81818… **or** 100x = 38.1818… and x = 0.381818… with intention to subtract. (if recurring dots not shown then showing at least **one** of the numbers to at least 5 sf) **or** $0.38+0.00\dot{1}\dot{8}$ **and** eg $100x = 0.1818...,\ 10\,000x = 18.1818...$ with intention to subtract.
	eg 10 000x – 100x = 3818.18... – 38.1818...= 3780 (9900x = 3780) **and** $\frac{3780}{9900}=\frac{21}{55}$ **or** eg 1000x – 10x = 381.818... – 3.81818...= 378 (990x = 378) **and** $\frac{378}{990}=\frac{21}{55}$ **or** eg 100x – x = 38.1818... – 0.381818...= 37.8 (99x = 37.8) **and** $\frac{37.8}{99}=\frac{21}{55}$ **or** eg 10 000x – 100x = 18.1818... – 0.181818...= 18 **and** $0.38+\frac{18}{9900}=\frac{38\times99+18}{9900}=\frac{3780}{9900}=\frac{21}{55}$ oe	shown		A1	for completion to $\frac{21}{55}$ dep on M1 *(NB: this is a "use algebra to show that…" question, so we need to see algebra as well as seeing all the stages of working to award full marks)*
					Total 2 marks

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Qn	Working	Answer	Mark	Notes
17 (a)	<table><tr><td>x</td><td>–2</td><td>–1</td><td>–0.5</td><td>0</td><td>1</td><td>1.5</td><td>2</td></tr><tr><td>y</td><td>0</td><td>4</td><td>3.4</td><td>2</td><td>0</td><td>0.9</td><td>4</td></tr></table>		2	B2 0, 2, 4 (B1 for 1 or 2 correct)
(b)		correct curve	2	B2 For correct smooth curve. (**there is an overlay for the curve – check the line now for (c)**) If not B2, then B1 for at least 5 points plotted correctly ft from table dep on B1 or B2 in (a)
(c)	$2x^3-6x+4=-3x$ **or** $x^3-3x+2=-\frac{3}{2}x$ or $y=-\frac{3}{2}x$ seen (allow $-\frac{3}{2}x$)		3	M1
	$y=-\frac{3}{2}x$ allow a correct line that intercepts with the curve eg of points on line (0, 0), (–1, 1.5), (–1.5, 2.25), (–2, 3)			M1 a correct line that intercepts with the curve (a correct line drawn implies M2)
	Answer dependent on a correct line being drawn	(x=) −1.6		A1ft accept −1.6 or −1.7 or ft their curve/line intercept **dep on a correct line being drawn** NB: if y value given as well then M2 only
				Total 7 marks

Qn	Working	Answer	Mark	Notes
18	eg $2n$, $2n + 2$, $2n + 4$ **or** $2n - 2$, $2n$, $2n + 2$ etc		3	M1 for 3 consecutive even numbers in algebraic form (any letter can be used)
	eg $(2n)^2 + (2n+4)^2 (= 4n^2 + 4n^2 + 16n + 16 = 8n^2 + 16n + 16)$ **or** $2(2n+2)^2$ $(= 2(4n^2 + 8n + 4) = 8n^2 + 16n + 8)$ **or** $2(2n+2)^2 + 8$ $(= 2(4n^2 + 8n + 4) + 8 = 8n^2 + 16n + 16)$			M1 for the sum of the squares of the largest and smallest even numbers and adding **or** the square of the middle even number multiplied by 2 (no need to expand or simplify for this mark)
	eg $(2n)^2 + (2n+4)^2 = 8n^2 + 16n + 16$ and $2(2n+2)^2 + 8 = 8n^2 + 16n + 16$ **or** $(2n)^2 + (2n+4)^2 = 8n^2 + 16n + 16$ and $2(2n+2)^2 = 8n^2 + 16n + 8$ and $8n^2 + 16n + 16 - (8n^2 + 16n + 8) = 8$ **or** $(2n)^2 + (2n+4)^2 = 8n^2 + 16n + 16$ and $8n^2 + 16n + 16 = 8n^2 + 16n + 8 + 8 = 2(2n+2)^2 + 8$ **or** $2(2n+2)^2 + 8 = 8n^2 + 16n + 16$ and $8n^2 + 16n + 16 = 4n^2 + 4n^2 + 16n + 16 = (2n)^2 + (2n+4)^2$ *Working required*	Correctly shown		A1 dep on M2 for use of algebra to show correct conclusion (SCB1 for eg $(p + 4)^2 + p^2$ or $2(p + 2)^2$ or $2(p + 2)^2 + 8$) (SCB2 for use of eg $(p + 4)^2 + p^2 = 2p^2 + 8p + 16$ and $2(p + 2)^2 + 8 = 2p^2 + 8p + 16$ If the student shows this and also says "it is true for all numbers, so it must be true for even numbers" oe or defines p, $p + 2$, $p + 4$ as even numbers, then this would gain M2A1
				Total 3 marks

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Qn	Working	Answer	Mark		Notes
19	$\sqrt{3}x - x = 6 + 2\sqrt{3}$ oe or $x - x\sqrt{3} = -6 - 2\sqrt{3}$ (allow $-2\sqrt{9}$ or $-2(\sqrt{3})^2$ for -6 or $2\sqrt{9}$ or $2(\sqrt{3})^2$ for 6)		4	M1	expanding bracket and collecting terms. Condone one error
	$(x =)\ \dfrac{6+2\sqrt{3}}{\sqrt{3}-1}$ oe eg $\dfrac{-6-2\sqrt{3}}{1-\sqrt{3}}$			A1	oe must be a correct fraction with irrational numerator and denominator
	$(x =)\ \dfrac{(6+2\sqrt{3})}{(\sqrt{3}-1)} \times \dfrac{(\sqrt{3}+1)}{(\sqrt{3}+1)}$ or $\dfrac{(6+2\sqrt{3})(\sqrt{3}+1)}{2}$ oe or $\dfrac{\left(6+2\sqrt{3}\right)}{\left(-1+\sqrt{3}\right)} \times \dfrac{\left(-1-\sqrt{3}\right)}{\left(-1-\sqrt{3}\right)}$ oe or $\dfrac{\left(-6-2\sqrt{3}\right)\left(1+\sqrt{3}\right)}{\left(1-\sqrt{3}\right)\left(1+\sqrt{3}\right)}$ oe			M1	(indep) Multiplying the numerator and denominator of their fraction by $\sqrt{3}+1$ oe or showing 2 or –2 as the denominator and multiplying the numerator by $\sqrt{3}+1$ oe or rationalising **their** denominator, so long as it is of the form $p + q\sqrt{3}$ where p and q are non zero integers (condone missing brackets provided meaning is clear)
	Working required	$6+4\sqrt{3}$		A1	dep on M1A1M1 with no errors seen
					Total 4 marks

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Qn	Working	Answer	Mark		Notes
20	eg $\frac{(4x+3)(x-5)}{2x-1}\times\frac{(2x-1)(x-3)}{(x+5)(x-5)}$ **or** eg $\frac{(4x+3)(x-3)}{x+5}(+(29-4x))$		4	M2	for factorising at least 2 of the quadratics correctly – could be implied by 2 factors cancelled correctly (M1 for factorising at least 1 of the 3 quadratics correctly)
	eg $\frac{(4x+3)(x-3)+(29-4x)(x+5)}{x+5}$ oe **or** eg $\frac{4x^2-9x-9+145+9x-4x^2}{x+5}$ oe			M1	for writing the correct fractions over a common denominator of $(x + 5)$ with or without brackets removed – need not be in simplest form. Could be written as 2 separate fractions.
	Correct answer scores full marks (unless from obvious incorrect working)	$\frac{136}{x+5}$		A1	
					Total 4 marks

Qn	Working	Answer	Mark	Notes
21 (a)	$P=\frac{k}{y^2}$		3	M1 oe (the constant term, k, can be any other letter apart from a or P or y)
	eg $a=\frac{k}{4^2}$ **or** $k=16a$			M1 oe
	Correct answer scores full marks (unless from obvious incorrect working)	$P=\frac{16a}{y^2}$		A1 oe eg $P=16ay^{-2}$ or $P=\frac{4^2a}{y^2}$
(b)	$\sqrt{"\frac{16a}{4a}"}=c\sqrt{a}$ oe eg $\frac{16a}{4a}=c^2a$ or $4a=\frac{16a}{c^2a}$ **or** $4a\times c^2a=16a$ **oe** **or** (when $P=4a$) $y^2=\frac{16a}{4a}$ **or** $y^2=4$ **or** $y=\sqrt{\frac{16a}{4a}}(=2)$ oe		3	M1 ft a correct formula involving the constant term (c used here) and a **or** ft for an expression or value of y^2 or y given for when $P=4a$
	$c=\sqrt{\frac{4}{a}}$ **or** $c=\frac{\pm2}{\sqrt{a}}$ **or** $c=\frac{\pm2\sqrt{a}}{a}$ oe allow the constant term squared eg $c^2=\frac{16a}{4a^2}\left(=\frac{4}{a}\right)$			M1 (implies previous M1) a correct value, in terms of a, for the constant term or the constant term squared – need not be simplified
	Correct answer scores full marks (unless from obvious incorrect working)	$P=\frac{4a^2}{x}$		A1 oe eg $P=\frac{\frac{16a}{4x}}{a}$ or $P=\frac{16a^2}{4x}$
				Total 6 marks

Qn		Working	Answer	Mark	Notes
22	(a)	$\overrightarrow{ON}=\mathbf{b}+\frac{2}{5}(\mathbf{a}-\mathbf{b})$ oe or $\overrightarrow{ON}=\mathbf{a}+\frac{3}{5}(\mathbf{b}-\mathbf{a})$ oe		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	$\frac{2}{5}\mathbf{a}+\frac{3}{5}\mathbf{b}$		A1 oe eg $\frac{1}{5}(2\mathbf{a}+3\mathbf{b})$ but must be one term in **a** and one in **b**
	(b)	$\overrightarrow{ME}=\frac{8}{5}\mathbf{a}-\frac{4}{5}\mathbf{b}$ $\overrightarrow{NE}=\frac{6}{5}\mathbf{a}-\frac{3}{5}\mathbf{b}$ *(all oe but simplified)* $\overrightarrow{MN}=\frac{2}{5}\mathbf{a}-\frac{1}{5}\mathbf{b}$		3	M1ft for one of $\overrightarrow{ME}$, $\overrightarrow{NE}$ or $\overrightarrow{MN}$ or one of $\overrightarrow{EM}$, $\overrightarrow{EN}$ or $\overrightarrow{NM}$ ft (dep on M1 in (a)) their expression for $\overrightarrow{ON}$ for this mark only [$\overrightarrow{ME}=\overrightarrow{ON}+\frac{6}{5}\mathbf{a}-\frac{7}{5}\mathbf{b}$ $\overrightarrow{MN}=\overrightarrow{ON}-\frac{4}{5}\mathbf{b}, \overrightarrow{NE}=-\overrightarrow{ON}+\frac{11}{3}\mathbf{a}$]
		$\overrightarrow{ME}=\frac{8}{5}\mathbf{a}-\frac{4}{5}\mathbf{b}$ $\overrightarrow{NE}=\frac{6}{5}\mathbf{a}-\frac{3}{5}\mathbf{b}$ *(all oe but simplified)* $\overrightarrow{MN}=\frac{2}{5}\mathbf{a}-\frac{1}{5}\mathbf{b}$			M1 for two of $\overrightarrow{ME}$, $\overrightarrow{NE}$ or $\overrightarrow{MN}$ or two of $\overrightarrow{EM}$, $\overrightarrow{EN}$ or $\overrightarrow{NM}$ **must be correct**
		Evidence of a vector method needed	shown		A1 eg $\overrightarrow{ME}=4\times\overrightarrow{MN}$ **or** $\overrightarrow{NE}=3\times\overrightarrow{MN}$ **or** $\overrightarrow{ME}=\frac{4}{3}\times\overrightarrow{NE}$ **or** showing they are multiples of the same vector eg $\overrightarrow{MN}=\frac{1}{5}(2\mathbf{a}-\mathbf{b}))$ and $\overrightarrow{NE}=\frac{3}{5}(2\mathbf{a}-\mathbf{b})$
					Total 5 marks

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					Edexcel averages: scores of candidates who achieved grade:								
Qn	**Skill tested**	**Mean score**	**Max score**	**Mean %**	**ALL**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**U**
1	Simultaneous linear equations	2.66	3	89	2.66	2.98	2.92	2.90	2.79	2.47	2.03	1.32	0.54
2	Quadratic equations	2.51	3	84	2.51	2.98	2.94	2.81	2.56	2.19	1.43	0.00	0.00
3	Graphs	2.43	3	81	2.43	2.94	2.87	2.71	2.53	1.93	1.25	0.47	0.13
4	Algebraic manipulation	2.51	3	84	2.51	2.96	2.83	2.64	2.50	2.18	1.61	0.00	0.00
5	Algebraic manipulation	1.59	2	80	1.59	1.96	1.88	1.80	1.53	1.26	0.86	0.49	0.11
6	Statistical measures	2.32	3	77	2.32	2.94	2.82	2.48	2.10	1.65	1.19	0.96	0.60
7	Algebraic manipulation	2.43	3	81	2.43	2.89	2.77	2.69	2.51	2.13	1.37	0.45	0.15
8	Powers and roots	1.48	2	74	1.48	1.95	1.83	1.64	1.40	0.90	0.66	0.19	0.12
9	Standard form	3.94	5	79	3.94	4.77	4.40	4.17	3.76	3.39	2.63	0.00	0.00
10	Fractions	2.39	3	80	2.39	2.72	2.64	2.45	2.39	2.18	1.85	1.25	0.71
11	Transformation geometry	2.01	3	67	2.01	2.80	2.46	2.05	1.65	1.25	0.80	0.00	0.00
12	Algebraic manipulation	3.61	6	60	3.61	5.64	4.73	3.67	2.60	1.47	0.69	0.00	0.00
13	Vectors	1.19	2	60	1.19	1.80	1.56	1.18	0.88	0.63	0.17	0.11	0.05
14	Inequalities	1.92	3	64	1.92	2.68	2.32	1.96	1.68	1.27	0.72	0.00	0.00
15	Quadratic equations	2.81	5	56	2.81	4.55	3.73	2.73	1.92	0.81	0.42	0.05	0.01
16	Applying number	1.12	2	56	1.12	1.69	1.46	1.14	0.86	0.54	0.25	0.09	0.01
17	Graphs	3.67	7	52	3.67	4.50	3.76	3.67	3.53	3.22	3.00	0.00	0.00
18	Algebraic manipulation	1.32	3	44	1.32	2.57	1.81	0.94	0.45	0.14	0.01	0.00	0.00
19	Powers and roots	1.65	4	41	1.65	2.87	1.95	1.53	1.12	0.54	0.17	0.04	0.02
20	Algebraic manipulation	1.66	4	42	1.66	3.22	1.94	1.31	0.81	0.30	0.14	0.03	0.00
21	Ratio and proportion	1.91	6	32	1.91	3.95	2.20	1.35	0.62	0.41	0.07	0.00	0.00
22	Vectors	1.75	5	35	1.75	3.85	2.10	0.91	0.46	0.23	0.02	0.00	0.00
	TOTAL	**48.88**	**80**	**61**	**48.88**	**69.21**	**57.92**	**48.73**	**40.65**	**31.09**	**21.34**	**5.45**	**2.45**

Suggested grade boundaries

Grade	**9**	**8**	**7**	**6**	**5**	**4**	**3**
Mark	64	53	45	36	26	14	4