Question	Working	Answer		Mark	Notes
1 (a)		$w^{12}$	1	B1	
(b)		$t^6$	1	B1	

Question	Working	Answer	Mark	Notes
2	e.g. $4x - 8x = 17 + 13$ oe		2	M1 For collecting terms in <i>x</i> and number terms on either side of a correct equation
		-7.5		A1 of e.g. $-\frac{30}{4}$
				Total 2 marks

Question	Working	Answer	Mark		Notes
3	$\frac{\frac{17}{3(-)11}}{4} \text{ or } \frac{5\frac{8}{12(-)2}9}{12}$		3	M1	Sight of $\frac{17}{3}$ and $\frac{11}{4}$ or $5\frac{8}{12}$ and $2\frac{9}{12}$
	$\frac{68}{12} - \frac{33}{12} \text{ or } 4\frac{20}{12} - 2\frac{9}{12}$			M1	or $\frac{68n}{12n} - \frac{33n}{12n}$
	$\frac{35}{12} = \frac{11}{12}$			A1	
	12 = 12				Dep on M2
	Alt:			M1	
	$3(+)\left(\frac{2}{3}-\frac{3}{4}\right)$			M1	
	3 (+) ( <del>8</del> - 9)			A1	
	$3 - \frac{1}{12} = 2 \frac{11}{12}$				Dep on M2
	12 12			M1	
	Alt:				
	$4\frac{5}{3}(-)2\frac{3}{4}$			M1	
	$2(+)\left(\frac{5}{3}-\frac{3}{4}\right)$			A1	Dep on M2
	$2(+)\left(\frac{20}{12}-\frac{9}{12}\right)$				1
	$= 2 \frac{11}{12}$				
					Total 3 marks

	Que	estion	Working	Answer	Mark		Notes
ſ	4		$x^9y^6$	$x^{9}y^{6}$	2	B1B1	Allow B1 if $(x^3y^2)^3$ or $(x^{36}y^{24})^{0.25}$ seen
							on answer line
							Total 2 marks

	Question	Working	Answer	Mark	Notes
5	i (i)		12, 18	1	B1
	(ii)		12, 14, 15, 16, 18, 20	1	B1
					Total 2 marks

Qu	estion	Working	Answer	Mark	Notes		
6	(a)		-5, 5, 5, -5	2	B2	All 4 correct values	
						If not B2 then B1 for 2 or 3 correct values	
	(b)			2	M1	Plotting at least 6 points correctly from their table	
						dep on B1 in part(a)	
			Fully correct curve		A1	Do not accept horizontal line at top of curve or	
						straight line segments	
						Total 4 marks	

Question	Working	Answer		Mark	Notes
7		$125x^{3}y^{6}$	2	B2	
				(B1)	for 2 correct terms as part of a product
					Total 4 marks

Question	Working	Answer	Mark		Notes
<b>8</b> (a)	$(x+2)(2x+3) = 2x^2 + 3x + 4x + 6$		3	M1	For multiplying a pair of brackets
	$(2x+3)(x-7) = 2x^2 - 14x + 3x - 21$				and getting 3 out of 4 terms correct.
	$(x+2)(x-7) = x^2 - 7x + 2x - 14$				
	$(2x^{2}+7x+6)(x-7) = 2x^{3}-14x^{2}+7x^{2}-49x+6x-42$			M1dep	For multiplying the product of the
	$(2x^{2}-11x-21)(x+2) = 2x^{3}+4x^{2}-11x^{2}-22x-21x-42$				first 2 brackets (ft from the 1st
	$(x^2-5x-14)(2x+3) = 2x^3+3x^2-10x^2-15x-28x-42$				stage) by the 3rd bracket, and
					getting at least 3 out of 6
					or 4 out of 8 terms correct
		$2x^3 - 7x^2 - 43x$		A1	Fully correct. isw extra work as
		- 42			long as correct
					e.g. $x(2x2 - 7x - 43) - 42$
	Alternative (all in one method)				
	(x+2)(2x+3)(x-7) =			M2	For at least 6 out of 8 correct terms
	$2x^3 - 14x^2 + 3x^2 - 21x + 4x^2 - 28x + 6x - 42$				
				(M1)	for 4 or 5 out of 8 correct terms
		$2x^3 - 7x^2 - 43x$		A1	Total 3 marks
		- 42			

Qu	estion	Working	Answer	Mark		Notes
9		Gradient = $(-)4 \div 2$ oe		3	M1	Correct method to work out the gradient
						(±)
						accept $4 \div 2$ oe or " $m$ " = 2
			y = -2x - 1 oe		A2	
						If not A2 then A1 for $L = -2x - 1$
						or $-2x - 1$
						or $y = 2x - 1$ or $y = -2x + c$
						Total 3 marks

Que	estion	Working	Answer	Mark		Notes
10	(a)	Plotting points from table at ends of interval		2	M1	$\pm^{1/2}$ sq (at least 5 points plotted
		(40, 6), (50, 20), (60, 56), (70, 84), (80, 95),				correctly) Or <u>all</u> points plotted
		(90, 100)				consistently within each interval at
						the correct heights
		Points joined with curve or line segments	Correct cf diagram		A1	Accept cf graph which is not joined
						to (30,0)
	(b)	Use of graph at 50		2	M1	Use of graph at 50 walkers
			58 - 59		A1	No working shown and answer is
						within 58 – 59 award M1A1
	(c)	86 or 87 or 88 indicated on graph or stated		3	M1	Use of their graph at 72 minutes
		100 – "86" or 100 – "87" or 100 – "88"			M1	Dep e.g. 12, 13 or 14 walkers
			12 13 14		A1	$0.12 \rightarrow 0.14$ inc, oe
			100 OC 100 OC 100			
						Total 7 marks

Question	Working	Answer	Mark		Notes
11 (a)	e.g. one correct value on the vertical scale e.g. 1 at high or 1 cm <sup>2</sup> = 5 passengers or 5 small squares = 1 passenger or (FD =) 24 ÷ 20 (= 1.2)	t 1 cm	3	M1	For a correct scale on the vertical axis or a 1 cm $\times$ 1 cm square = 5 passengers or other correct scale or one correct product or frequency (other than the 24) or (FD =) 24 $\div$ 20 (= 1.2)
	$10 \times 0.4 (= 4)$ $10 \times 1.8 (= 18)$ $5 \times 6.4 (= 32)$ $15 \times 2 (= 30)$ $20 \times 0.8 (= 16)$			M1	At least 3 correct products or frequencies (other than the 24) stated (could be seen on diagram)
		124		A1	
(b)	e.g. 0.25 × 24 + 20 × 0.8 (= 22) or "1.2" × 5 + 20 × 0.8 (= 22)		2	M1	ft from (a)
		"22"		A1ft	oe (0.17(741))
		"124"			
					Total 5 marks

Question	Working	Answer	Mark	Notes
12	$2x^2 + 3(2x+1)^2 = 5$		5	M1 $2\left(\frac{y-1}{2}\right)^2 + 3y^2 = 5$
	eg $14x^2 + 12x - 2 = 0$ or if completing the square, allow $14x^2 + 12x = 2$ oe			A1 $7y^2 - 2y - 9 = 0$ or if completing the square, allow $7y^2 - 2y = 9$ oe
	eg $(7x - 1)(x + 1)$ or $(7x - 1)(2x + 2)$ eg $\frac{-12 \pm \sqrt{12^2 - 4 \times 14 \times -2}}{2 \times 14}$ oe			M1 ft as long as M1 awarded and 3 term quadratic eg $(7y - 9)(y + 1)$ $2\pm\sqrt{(-2)^2 - 4 \times 7 \times -9}$
	eg $7\left(\left(x+\frac{3}{7}\right)^2-\frac{9}{49}\right)=2$ oe			eg $2 \times 7$ oe $7\left(\left(y - \frac{1}{7}\right)^2 - \frac{1}{49}\right) = 9$ oe
	$x = \frac{1}{7}, x = -1$ (need both)			A1 $y = \frac{9}{7}, y = -1$ (need both)
		$x = \frac{1}{7}$ , $y = \frac{9}{7}$		A1 Dep on M1 Must be paired correctly Must be 3 sf or better (0.142857) (1.28571)
		x = -1, y = -1		
				Total 5 marks

Question	Working	Answer	Mark	Notes
13	e.g. $p^{2}(2m-y) = x + m$		3	M1 Multiplying by denominator and expanding bracket
	$2p^2m - p^2y = x + m$			M1 Collect terms in m and factorise in a correct equation
	$2p^{2}m - m = x + p^{2}y$ $m(2p^{2} - 1) = x + p^{2}y$	$m = \frac{x + p^2 y}{2p^2 - 1}$		A1 oe eg $m = \frac{-x - p^2 y}{m! = 2p^2}$ must have m!= 2p <sup>2</sup>
				Total 3 marks

Question	Working	Answer	Mark		Notes
14	(Gradient of $L_1 =$ ) $6 \div 2 (=3)$		4	M1	could be seen as part of an
					equation. Ignore constant term if
					candidate rearranges $L_1$
	<i>m</i> ד3"⊨−1 or			M1	for use of $m_1m_2 = -1$
	$m = -\frac{1}{3}$				could be seen as part of an equation
	$-1 = "-\frac{1}{3}" \times 9 + c$ or $y1 = "-\frac{1}{3}"(x-9)$ or $c = 2$	2		M1	
		$y + \frac{1}{3}x = 2$		A1	oe in required form eg $3y + x = 6$ , 6y + 2x = 12 etc
					Total 4 marks

Question	Working	Answer	Mark	Notes
<b>15</b> (i)		(9, 3)		B1
(ii)		(4, 9)	1	B1

Que	estion	Working	Answer	Mark		Notes
16	(a)		<b>3</b> <b>4</b> oe	1	B1	
	(b)	$\frac{x-5}{4(x-5)-3}$		2	M1	
			$\frac{x-5}{4x-23}$		A1	cao
	(c)	$y = \frac{x}{4x - 3}$ or $x = \frac{y}{4y - 3}$		3		
		$y(4x-3) = x  \text{or} \qquad x(4y-3) = y$ $4xy - 3y = x  \text{or} \qquad 4xy - 3x = y$ $4xy - x = 3y  \text{or} \qquad 4xy - y = 3x$			M1	Moving the denominator to the other side of the equation
		x(4y-1) = 3y or $y(4x-1) = 3x$			M1	Factorising the variable on one side in a correct expression
			$\frac{3x}{4x-1}$ oe		A1	
	(d)	Tangent drawn at $x = -0.5$ (G =) 18 ÷ 3 oe		3	M1 M1	Drawing a tangent at $x = -0.5$ Correct method to work out the gradient of the tangent at $x = -0.5$ or x
			$5 \rightarrow 7$		A1	= + 0.5 Dep on 1 <sup>st</sup> M1
						SC B1 B1 for drawing a tangent at $x = +0.5$ and gradient $= -3 \rightarrow -4$
						Total 9 marks

Que	stion	Working	Answer	Mark		Notes
17		$a^{n} - \frac{3^{n}}{2}$		2	M1	for a correct first step e.g. $3^{2y}$ or $3^{-2y}$
		$3^{3} = \frac{3^{2}y}{3^{2}y}$	n = x - 2y		A1	
						Total 2 marks

Question	Working	Answer	Mark		Notes
18	$\frac{x-4}{x} \times \frac{x-5}{x-1} = 0.7$ 3x2 - 83x + 200 (= 0) oe		5	M2 A1	If not M2 then M1 for either $\frac{x-4}{x}$ or $\frac{x-5}{x-1}$
	$\frac{83 \pm \sqrt{83^2 - (4 \times 3 \times 200)}}{2 \times 3} \text{ or } (3x - 8)(x - 25) (=0)$ or $(x - 83/6)2 + 200/3 - 832/36 (=0)$	25		M1 A1	Rearrangement of their quadratic to the form $ax^2 + bx + c (= 0)$ 1st step in solving the correct 3 term quadratic
				M2	Accept 25 only (dep on M3 if using algebra)
	Alt: y = yellow marbles $\frac{y}{y+4} \times \frac{y-1}{y+3} = 0.7$			A1 M1	If not M2 then M1 for either $\frac{y}{y+4}$ or $\frac{y-1}{y+3}$
	$3y2 - 59y - 84 (= 0) \text{ oe}$ $\frac{59 \pm \sqrt{59^2 - (4 \times 3 \times - 84)}}{2 \times 3} \text{ or } (3y + 4)(y - 21)$ or $(y - 59/6)2 - 84/3 - 592/36 (=0)$				Rearrangement of their quadratic to the form $ay^2 + by + c (= 0)$ 1st step in solving the correct 3 term quadratic
	y = 21 $21+4$	25		A1	Accept 25 only (dep on M3 if using algebra) Give full marks if $\frac{21}{25} \times \frac{20}{24} = 0.7$ seen and 1st M2 scored NB: SC B1 for completing 1st step in solving incorrect 3 term quadratic
					Total 5 marks

Question	Working	Answer	Mark	Notes	
19	$-2(x^2-6x)+5$ or $-2[(x]^2-6x-2.5)$		4	M1 Factorising by extr correct expression	acting $-2$ in a
	$-2[(x-3)^2 - 9 - 2.5]$ or $-2[(x-3)^2 - 9] + 5$			M1 Correct expression $5 + 12x - 2x^2$	equivalent to
	$[-2[(x-3)]^2 - 11.5]$ or $-2(x-3)^2 + 18 + 5$			M1 Correct expression $5 + 12x - 2x^2$	equivalent to
		23 - 2(x - 3) <sup>2</sup>		A1 Award full marks are correctly state	
				$23 - 2(x - 3)^2$ is not stated anyw SC B3 for $23 - 2(3)^2$ SC B2 for $-2(x - 3)^2$	- x) <sup>2</sup> 3) <sup>2</sup> + constant
	Alt:			SC B1 for $-2(x +$	$(-3)^2$ +constant
	Alt: $a + b(x^2 + 2cx + c^2)$ $2bc = 12 \text{ or } a + bc^2 = 5 \text{ or } b = -2$			M1 Multiplying out ex M1 correctly	pression
	$2 \times -2 \times c = 12 \text{ or } c = -3$			M1 Equating coefficient value of b	_
	$a + -2 \ge (-3)^2 = 5$ or $a = 23$ seen			M1 Method to calculat Method to calculat	
		23 - 2(x - 3) <sup>2</sup>		SC B3 for 23 – 2(3	
					Total 4 marks

Question	Working	Answer	Mark	Notes
20		a = -2, b = 3	2	B2 <b>or</b> $a = 2, b = -3$
				(B1) for $a = -2$ or $a = 2$ or $b = 3$ or $b = -3$
				Total 4 marks

Question	Working	Answer	Mark		Notes
21	$\frac{1}{r(r+1)}$		4		Algebraic representation of one of the
	(Term $n =$ ) $\frac{1}{2}n(n+1)$ or			M1	two consecutive terms in sequence
	$\frac{1}{(\text{Term } n+1=)} \frac{1}{2(n+1)(n+2)}$ $\frac{1}{2}n(n+1) + \frac{1}{2}(n+1)(n+2)$			M1	Adding two consecutive terms
	$\frac{1}{2}(n+1)(n+n+2) = \frac{1}{2}(n+1)(2n+2)$				Factorisation or multiplying out
				M1	correctly to get to $n^2 + 2n + 1$
	$\frac{1}{2}n^{2} + \frac{1}{2}n + \frac{1}{2}n^{2} + \frac{1}{2}n + n + 1 \rightarrow n^{2} + 2n + 1$	(n+1) <sup>2</sup> shown		A1	Dep on M3
					Total 4 marks

Question	Working	Answer	Mark	Notes
22	$\overrightarrow{AP} = \frac{3}{4} \times 2\mathbf{c} \ (=\frac{3}{2}\mathbf{c}) \ \mathrm{oe}$		5	M1 For $\overrightarrow{AP} = \frac{3}{2}\mathbf{c}$ oe, eg could be part of
				$\overrightarrow{OP} = \mathbf{a} + \frac{3}{2}\mathbf{c}$ oe or on diagram
	$\overrightarrow{AC} = \mathbf{c} - \mathbf{a}$ oe or $\overrightarrow{CA} = \mathbf{a} - \mathbf{c}$ oe			M1
	$\overrightarrow{OQ} = \mathbf{c} + n(\mathbf{a} - \mathbf{c}) \text{ or } \overrightarrow{OQ} = \mathbf{a} + n(\mathbf{c} - \mathbf{a})$			M1
	or $\overrightarrow{QP} = n(\mathbf{a} - \mathbf{c}) + \frac{3}{2}\mathbf{c}$			
	$\frac{n}{1-n} = \frac{2}{3} \Longrightarrow n = \frac{2}{5}  \text{oe or}$			M1
	$\frac{1-n}{n} = \frac{2}{3} \Longrightarrow n = \frac{3}{5}  \text{oe}  \text{or}$			
	$\frac{n}{\frac{3}{2}-n} = \frac{2}{3} \implies n = \frac{3}{5} \text{ oe}$			
		3:2		A1 oe, dep on M3
				Total 5 marks

#### Performance data for Practice Test 1H (Set 11)

				Edexcel averages: scores of candidates who achieved grade:							
New	Mean	Max	Mean			-	_		_		_
Qn	score	score	%	ALL	9	8	7	6	5	4	3
1	0.97	1	97	0.97	1.00	0.99	0.98	0.98	0.96	0.94	0.83
	0.96	1	96	0.96	1.00	0.99	0.99	0.97	0.97	0.92	0.83
2	1.79	2	90	1.79	1.94	1.90	1.88	1.82	1.74	1.41	1.20
3	2.68	3	89	2.68	2.95	2.90	2.84	2.78	2.46	1.99	1.49
4	1.74	2	87	1.74	1.98	1.94	1.80	1.66	1.50	1.29	0.99
5	0.81	1	81	0.81	0.96	0.90	0.85	0.76	0.67	0.54	0.36
	0.73	1	73	0.73	0.95	0.87	0.78	0.66	0.52	0.32	0.20
6	1.85	2	93	1.85	1.99	1.94	1.89	1.82	1.74	1.66	1.48
	1.59	2	80	1.59	1.86	1.73	1.62	1.48	1.37	1.22	1.03
7	1.57	2	79	1.57	1.97	1.86	1.68	1.46	1.11	0.84	0.66
8	2.29	3	76	2.29	2.89	2.70	2.44	2.13	1.73	1.16	0.62
9	2.08	3	69	2.08	2.92	2.70	2.29	1.72	1.04	0.41	0.17
10	1.65	2	83	1.65	1.90	1.82	1.75	1.60	1.36	1.14	1.03
	1.34	2	67	1.34	1.84	1.68	1.42	1.16	0.75	0.45	0.19
	1.91	3	64	1.91	2.67	2.37	2.04	1.63	1.06	0.60	0.20
11	1.93	3	64	1.93	2.77	2.48	2.05	1.52	1.01	0.51	0.36
	1.12	2	56	1.12	1.73	1.47	1.17	0.83	0.47	0.23	0.07
12	2.83	5	57	2.83	4.66	3.91	2.78	1.70	1.02	0.43	0.29
13	1.54	3	51	1.54	2.82	2.22	1.37	0.71	0.37	0.13	0.05
14	1.80	4	45	1.80	3.57	2.69	1.38	0.64	0.25	0.07	0.01
15	0.45	1	45	0.45	0.87	0.65	0.38	0.20	0.08	0.03	0.02
	0.43	1	43	0.43	0.84	0.59	0.34	0.19	0.09	0.03	0.04
16	0.45	1	45	0.45	0.76	0.68	0.44	0.22	0.12	0.03	0.01
	1.33	2	67	1.33	1.91	1.75	1.46	1.03	0.66	0.24	0.19
	1.54	3	51	1.54	2.83	2.25	1.39	0.70	0.26	0.05	0.02
	0.98	3	33	0.98	2.17	1.30	0.67	0.32	0.13	0.03	0.00
17	0.74	2	37	0.74	1.68	1.01	0.45	0.19	0.07	0.02	0.01
18	1.68	5	34	1.68	4.44	2.21	0.63	0.19	0.03	0.00	0.00
19	1.31	4	33	1.31	3.33	1.69	0.59	0.22	0.07	0.03	0.01
20	0.57	2	28	0.57	1.19	0.69	0.39	0.27	0.14	0.11	0.05

21	0.98	4	25	0.98	2.74	1.08	0.32	0.16	0.05	0.04	0.00
22	1.06	5	21	1.06	2.06	1.40	0.92	0.50	0.23	0.07	0.03
	44.70	80	59	44.70	69.19	55.36	41.98	32.22	24.03	16.94	12.44

#### Suggested grade boundaries

1MA1 Practice Tests (Set 10)			9	8	7	6	5	4	3	2	1
1H	Higher tier	Paper 1H	62	49	37	28	21	14			
2H/3H	Higher tier	Paper 2H/3H	64	52	41	31	22	15			
Total	Higher tier		135	109	85	65	48	33			

(Marks for papers 1H, 2H/3H are each out of 80.)