BUMPER "BETWEEN PAPERS" PRACTICE

SUITABLE FOR HIGHER TIER ONLY

Summer 2023

Markscheme

Not A "best" Guess paper.

Neither is it a "prediction" ... only the examiners know what is going to come up! Fact!
You also need to REMEMBER that just because a topic came up on paper 1 it may still come up on papers 2 or 3 ...

We know how important it is to Practice, practice, practice .... so we've collated a load of questions that weren't examined in the Pearson/edexcel 9-1 GCSE Maths paper 1 but we cannot guarantee how a topic will be examined in the next papers ...

Enjoy!
Mel & Seager

Q1.

Question	Working	Answer	Mark	Notes
(a)		$5^{1}/_{4}$	1	B1 for $5^{1}/_{4}$ oe

Q2.

Question	Answer	Mark	Mark scheme	Additional guidance
	0.319	M1	for partial method eg 1.70(499…) or 16.74 or $\frac{837}{50}$ or 0.101(8516…) or 0.102 or 0.32	
		A1	for 0.319(1419…)	Accept 0.319 or better. Condone incorrect digits after the 0.319; incorrect rounding if 0.319(1419…) is shown in working.

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
	17.4	B1	for stating any correct bound, eg. 6.75 or 6.85 or 0.045 or 0.055	Accept 6.849̇ or 6.8499… for 6.85 and 0.0549̇ or 0.05499.. for 0.055
		M1	using both UB of e and LB of f to work out value of $2e \div f$, eg 2[UB of e] ÷ [LB of f] or $\frac{2 \times 6.85}{0.045}$	$6.8 < \text{UB}(e) \leq 6.85$ $0.045 \leq \text{LB}(f) < 0.05$
		A1	for answer in the range 17.4 to 17.5 from correct working	If an answer is given in the range in working and then rounded incorrectly award full marks. Award 0 marks for a correct answer with no (or incorrect) supportive working

Q4.

Question	Answer	Mark	Mark scheme	Additional guidance
	9.35, 9.45	B1	for 9.35 in the correct position	
		B1	for 9.45 in the correct position	Accept 9.449̇ oe or 9.4499…oe

Q5.

PAPER: 1MA0 1F

Question	Working	Answer	Mark	Notes
*		Has enough (with evidence)	5	M1 for splitting the shape (or showing recognition of the "absent" triangles) and using a method to find the area of one shape M1 for a complete method to find the total area, (= 9 m²) M1 (dep M1) for a method to find the number of packs required from their total area, eg. "9" ÷ 2 = 4.5 rounded up to 5 M1 for a method to find 75% of 24.80 or 75% of the cost of their total number of packs, eg. 24.80 × 5 × $\frac{75}{100}$ (= 93) or 24.80 × $\frac{75}{100}$ (= 18.6) C1 for a conclusion supported by fully correct answers, eg. showing 9 (m²), 5 (packs) and 93 or 7 (from 100 − 93) **OR** M1 for method to find 75% of £24.80, eg. 24.80 × $\frac{75}{100}$ (= 18.6) M1 for method to find total number of packs Mary can buy, eg. 100 ÷ "18.60" = 5.3.... truncated to 5 or 10 (m²) M1 for finding area of one relevant shape or showing how one pack (2 m²) can fit in the diagram M1 (dep on previous M1) for complete method to show that 5 packs can cover the floor C1 for a conclusion supported by fully correct answers, showing the capacity (10) greater than total area (9)

Q6.

Question	Working	Answer	Mark	Notes
	1200 × 1.035³ Or 1200 × 1.035 = 1242 1242 × 1.035 = 1285.47 1285.47× 1.035 = 1330.46	1330.46	3	M2 for 1200 × 1.035³ A1 1330.46 – 1330.47 Or M1 1200 × 1.035 M1(dep) for ' 1242'× 1.035 and '1285.47'× 1.035 A1 1330.46 – 1330.47 [SC: B1 for 42 or 84 or 126 or 1242 or 1284 or 1326 seen, if M0 scored]

Q7.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	$\dfrac{95}{28}$	M1	for a method to add using common denominators with at least one fraction correct (matching numerator with common denominator) eg $\dfrac{60}{28}+\dfrac{35}{28}$ or $(2)\dfrac{4}{28}+(1)\dfrac{7}{28}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	$\dfrac{95}{28}$ oe eg $3\dfrac{11}{28}$	
(b)	$1\dfrac{3}{5}$	M1	for $\dfrac{6}{5}\times\dfrac{4}{3}$ or $\dfrac{24}{20}\div\dfrac{15}{20}$ or $\dfrac{8}{5}$ oe eg $1\dfrac{9}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	cao	

Q8.

	Working	Answer	Mark	Notes
		2.52×10^{15}	2	M1 for 4.032×10^9 or 4 032 000 000 or sight of figures 252 A1 for 2.52×10^{15}

Q9.

Question	Working	Answer	Mark	Notes
	$\dfrac{64.8-59.3}{64.8}\times100$ $(=8.487...)$ **OR** $^{59.3}\!/_{64.8}\times100=91.512$ $100-'91.512'=8.487...)$	8.49	3	M1 $64.8-59.3$ $(=5.5)$ M1 (dep) $^{'5.5'}\!/_{64.8}\times100$ oe A1 $8.48-8.49$ **OR** M1 $^{59.3}\!/_{64.8}\times100$ oe $(=91.5(12...))$ M1 (dep) $100-'91.5'$ A1 $8.48-8.49$ **OR** M1 $^{59.3}\!/_{64.8}$ $(=0.915(12...))$ M1 (dep) $100\times(1-'0.915')$ A1 $8.48-8.49$

Q10.

PAPER: 1MA0/2H				
Question	Working	Answer	Mark	Notes
		17.7(014...)	3	B1 for 7.75 or 7.85 or 5.15 or 5.25 or 62.5 or 63.5 M1 for $\dfrac{1}{2}\times7.75\times5.15\times\sin62.5$ A1 for 17.7(0140994...)

Q11.

Question	Working	Answer	Mark	Notes
		$\dfrac{5}{7}$	P1	for $\dfrac{7}{5}=1.4$ or $\dfrac{5}{7}=0.7..$ or compares $\dfrac{1}{7}$ to $\dfrac{1}{5}$ or compare $\dfrac{5}{7}$ to 1 eg $1-\dfrac{5}{7}\left(=\dfrac{2}{7}\right)$ or compare $\dfrac{7}{5}$ to 1 eg $\dfrac{7}{5}=1\dfrac{2}{5}$ or eg $\dfrac{49}{35}$ or $\dfrac{14}{35}$ or $\dfrac{25}{35}$ oe
		supported	P1	for $\dfrac{7}{5}=1.4$ and $\dfrac{5}{7}=0.7..$ or compares $\dfrac{5}{7}$ to 1 eg $1-\dfrac{5}{7}\left(=\dfrac{2}{7}\right)$ and $\dfrac{7}{5}$ to 1 eg $\dfrac{7}{5}=1\dfrac{2}{5}$ or two correct fractions with common denominator eg $\dfrac{49}{35}$ and $\dfrac{25}{35}$
			C1	for $\dfrac{5}{7}$ with supporting evidence

Q12.

		Working	Answer	Mark	Notes
	(a)	0.016 × 500 = 8 0.03 × 500 = 15 0.08 × 250 = 20 0.096 × 250 = 24 0.026 × 1000 = 26	(8), 15, 20, 24, 26	2	M1 for correct calculation to find one frequency e.g. 0.03 × 500 or 0.08 × 250 or 0.096 × 250 or 0.026 × 1000 or for one frequency correct or establishing that 1 cm² = 2.5 fish A1 for all frequencies correct
	(b)	0.026 × 500 = 13 8 + 15 + 20 + 24 + 26 = 93	13 : 93	2	M1 ft for a complete correct method to find the number of fish over 2000 g ie 0.026 × 500 (=13) or '26'÷2 A1ft for 13 : 93 or '0.026 × 500' : 'total for all their fish' or '26'÷2 : 'total for all their fish'
	(c)	47th item needed	1292	2	SCB1 for 93:13 given as the answer M1 for a complete correct method to divide the area of the histogram into two equal parts **OR** for a complete correct method to interpolate for the 47th value A1 for answer in range 1290 to 1300

Q13.

Question	Answer	Mark	Mark scheme	Additional guidance
	3 : 10	P1	process to find ratio of lengths $A:B = \sqrt{4}:\sqrt{25}\ (= 2:5\ or\ \frac{2}{5}\ or\ 2, 5)$	Accept working in fractions for the award of process marks but the final answer must be in correct simplified ratio notation
		P1	for process to find ratio of lengths $B:C = \sqrt[3]{27}:\sqrt[3]{64}\ (= 3:4\ or\ \frac{3}{4}\ or\ 3, 4)$	
		P1	for process to write as one ratio eg. finding a common multiple of 3 and 5 or 6 : 15 : 20 oe	
		A1	cao	

Q14.

PAPER: 5MB3H_01

Question	Working	Answer	Mark	Notes
		$\dfrac{59}{330}$	3	M1 for $100x = 17.87878787\ldots$ or $1000x = 178.7878787\ldots$ **and** $10x = 1.7878787$ M1 (dep) for subtraction, $100x - x$ or $1000x - 10x$ or $\dfrac{17.7}{99}$ or $\dfrac{177}{990}$ seen A1 working leading to given fraction

Q15.

		Working	Answer	Mark	Notes
	(a)		820 000	1	B1 cao
	(b)		3.76 × 10⁻⁴	1	B1 cao
	(c)		5 × 10⁸	2	M1 for 2.3 ÷ 4.6 × 10^{12-3} oe or 500 000 000 or 0.5 × 10⁹ A1 cao (accept 5.0 × 10⁸)

Q16.

Question	Working	Answer	Mark	Notes
			M1 M1	for the start of a method to convert 0.22.. to a fraction, eg $10y = 2.22..$ or $(y=)\frac{2}{9}$ for the start of a method to convert 0.13636... to a fraction,
			C1	$10x = 1.3636..$ or $100x = 13.6363...$ or $1000x = 136.3636..$ or $(x=)\frac{13.5}{99}$ or $(x=)\frac{135}{990}$ for correct arithmetic and concluding the proof OR
			M1 M1	for $0.13\dot{6} \times 0.\dot{2} = 0.0\dot{3} \ (=z)$ for complete method to find two appropriate recurring decimals the difference of which is a rational number,
			C1	eg. $100z = 3.0303...,(z=) \ 0.0303...$ or $\frac{3}{99}$ for correct arithmetic and concluding the proof

Q17.

PAPER: 1MA0/2H

Question	Working	Answer	Mark	Notes
(a)		5, 30, 60, 75, 80	1	B1 for correct cumulative frequencies (may be implied by correct heights on the grid)
(b)		cf graph	2	M1 for at least 4 of the 5 points plotted correctly at the ends of the intervals or 4 of the 5 points plotted not at the ends but consistently within each interval and joined (dep on a cf table with no more than one arithmetic error) A1 for a fully correct cf graph (points may be joined by a curve or straight line segments)
(c)	IQR = UQ − LQ	26-28	2	M1 for reading values from their cf graph at cf = 20 or 20.25 **and** cf = 60 or 60.75 A1ft provided M1 is awarded in (b)
(d)		55-59	3	M1 for reading a value from their cf graph at weight 150 grams M1 for $\frac{"45"}{"80"} \times 100$ A1ft provided M1 is awarded in (b)

Q18.

Question	Working	Answer	Mark	Notes
	$4n^2 + 12n + 3^2 - (4n^2 - 12n + 3^2)$ $= 4n^2 + 12n + 9 - 4n^2 + 12n - 9$ $= 24n$ $= 8 \times 3n$	Proof	3	M1 for 3 out of 4 terms correct in expansion of either $(2n + 3)^2$ or $(2n - 3)^2$ **or** $((2n + 3) - (2n - 3))((2n + 3) + (2n - 3))$ A1 for $24n$ from correct expansion of both brackets A1 (dep on A1) for $24n$ is a multiple of 8 or $24n = 8 \times 3n$ or $24n \div 8 = 3n$

Q19.

Question	Working	Answer	Mark	Notes
		7.21 (am)	3	M1 for listing multiples 9,18,27,36 and 12,24,36 (condone 1 arithmetic error) or method to find LCM M1 for identifying 36 as LCM A1 cao OR M1 for listing times 6.54, 7.03, 7.12, 7.21 or for listing times 6.57, 7.09, 7.21 (condone one arithmetic error) M1 for listing times 6.54, 7.03, 7.12, 7.21 **and** 6.57, 7.09, 7.21 (condone one arithmetic error) A1 cao

Q20.

PAPER: 1MA0/1F

Question	Working	Answer	Mark	Notes
*		95° with reasons	4	M1 for angle $DBC = 180 - 125$ (= 55) or angle $EAC = 180 - 125$ (=55) (May be on diagram) A1 for $x = 95$ C2 (dep on M1) with full reasons for their given method, e.g. <u>angles</u> on a straight <u>line</u> add up to <u>180°</u> **and** <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> **and** <u>corresponding</u> <u>angles</u> are equal or <u>allied</u> angles / co-interior angles add up to <u>180°</u> **and** <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> (C1 (dep on M1) for one appropriate reason linked to parallel lines) M1 for angle CDB = 125 – 30 (= 95)) (May be on diagram) A1 for $x = 95$ C2 (dep on M1) for full reasons, for their given method, e.g. <u>exterior</u> angles are equal to the sum of the <u>interior</u> <u>opposite</u> angles **and** <u>corresponding</u> <u>angles</u> are equal (C1 (dep on M1) for one of these appropriate reasons linked to parallel lines)

Q21.

	Working	Answer	Mark	Notes
(a)	154500 – 150000 $^{4500}/_{150000} \times 100$	3	3	M1 for 154500 – 150000 or 4500 M1 for $^{'154500 - 150000'}/_{150000} \times 100$ oe A1 cao **OR** M1 for $^{154500}/_{150000}$ (× 100) M1 for $"^{154500}/_{150000} \times 100" - 100$ oe A1 cao
(b)	$154500 \times ^4/_{100} +$ 154500 $160680 \times ^4/_{100} +$ 160680 or 154500×1.04^2	167107.20	3	M1 for $154500 \times ^4/_{100}$ or 6180 **or** 12360 **or** 160680 **or** 166860 **or** 1.04×154500 M1 (dep) for $(154500 + '6180') \times ^4/_{100}$ or 6427.2(0) or ' 160680' × 1.04 A1 for 167107.2(0) as final answer **OR** M2 for 154500×1.04^2 (M1 for 154500×1.04) A1 167107.2(0) as final answer

Q22.

Question	Working	Answer	Mark	Notes
(a)		0.625	B1	cao
(b)		$9.75 \leq x < 9.85$	B2	$9.75 \leq x < 9.85$
			[B1	for 9.75 **or** 9.85 (or $9.84\dot{9}$)]

Q23.

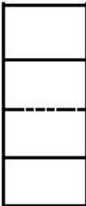| Question	Answer	Mark	Mark scheme	Additional guidance
	$2^2 \times 5^3$	M1	for a complete method to find prime factors; could be shown on a complete factor tree with no more than one error or by division by prime factors with no more than one error	Condone the inclusion of 1 for the method marks
		M1	for complete factorisation, eg 2, 2, 5, 5, 5	Could be shown on a fully correct factor tree
		A1	for $2^2 \times 5^3$	

Q24.

PAPER: 5MB2H_01

Question	Working	Answer	Mark	Notes
(i)		126	2	B1 cao
(ii)		Reason		B1 for reason relating to geometrical property & parallel lines which is not contradicted by method shown elsewhere eg <u>alternate</u> angles are <u>equal</u>, <u>corresponding</u> angles are <u>equal</u>, <u>allied</u> angles / co-<u>interior</u> <u>angles</u> add up to <u>180°</u>

Q25.

Question	Answer	Mark	Mark scheme	Additional guidance
	No (supported)	P1	for a conversion with litres and gallons, eg $18 \div 4.5 (= 4)$ or $8 \times 4.5 (= 36)$	See page at end of mark scheme
		P1	for a conversion with £ and euros, eg $27 \times 0.85 (= 22.95)$ or $40.8 \div 0.85 (= 48)$	
		P1	for finding the unit price, eg $27 \div 18 (= 1.5)$ **OR** finding proportionality for fuel eg ("36" $\div 18$) (= 2)	May compare cost per gallon or cost in euros May be seen in a calculation or given in a description Accept comparative figures rounded or truncated No is implied by eg Wales is cheaper
		C1	for No with comparative figures, eg No with 20.4 **and** 22.95 or No with 1.275 **and** 1.133..	

Q26.

Question	Answer	Mark	Mark scheme	Additional guidance
	Elevation	B2	fully correct side elevation 5 high and 3 wide	
		(B1	for a rectangle 5 high and 3 wide or correct side elevation in the wrong orientation)	

Q27.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Frequency diagram See end of m/s	C3 (C2 (C1	for a fully correct frequency diagram for at least 5 correct values in the frequency diagram) for at least 3 correct values in the frequency diagram)	If probabilities used instead of frequencies then maximum of C2 can be awarded
(b)	$\frac{12}{72}$	M1	for $\frac{a}{72}$ where $0 < a < 72$ and a is an integer or $\frac{12}{b}$ where $b > 12$ and b is an integer or $12 : 72$ or ft their values for 72 and/or 12 from (a)	Accept equivalent decimal or percentage forms of probability Ignore errors in cancelling of their $\frac{12}{72}$
		A1	for $\frac{12}{72}$ oe or ft (a)	

Q28.

Question	Working	Answer	Mark	Notes
(a)		365	M1	fx with x consistent within intervals eg 200×1 , 300×11 , 400×5 , 500×0 , 600×3, if 200, 3300, 2000, 0, 1800 are seen without working then condone 1 error
			M1	(dep) $\Sigma fx \div \Sigma f$ eg "7300" $\div$ 20
			A1	Cao
(b)		Comment	C1	for comment about outliers affecting mean

Q29.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	138	M1	for upper quartile = 188 or lower quartile = 50 or an indication that they are trying UQ – LQ	Could be written on the grid
		A1	cao	
(b)	Yes, with reason	C1	Yes, with reason **Acceptable examples** Yes, because the median is at 2 hour (120 min) Yes, since 50% is at the 2 hour mark Yes, because the middle is at 2 hours **Not acceptable examples** No ….. The median is at the 2 hour mark Yes, because 50% is exactly half way between "188" and "50"	
(c)	statement	C1	**Acceptable examples** The median is lower on Tuesday (higher on Monday) The upper quartile is lower on Tuesday (higher on Monday) There may just have been one person waiting for 210 mins We don't know how many people were waiting for each time **Not acceptable examples** The range is bigger for Tuesday (smaller for Monday) The IQR is smaller for Tuesday (bigger for Monday)	

	M	T
Shortest time	20	20
Lower quartile	50	50
Median	120	100
Upper quartile	188	140
Longest time	200	210
Range	180	190
IQR	138	90

Q31.

Question	Working	Answer	Mark	Notes
(a)		5, −1, 5	2	B2 for all 3 correct (B1 for 1 or 2 correct)
(b)		Correct graph	2	M1 ft for 5, 6 or 7 points plotted correctly, provided at least B1 awarded in (a) A1 for a fully correct graph (no line segments)
(c)		−0.6, 3.6	2	M1 for use of $y = 3$ A1 for −0.5 to −0.7, 3.5 to 3.7 (ft quadratic graph)

(a)
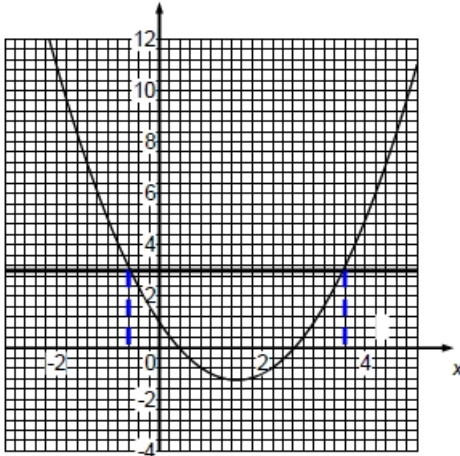
Q31.

Question	Answer	Mark	Mark scheme	Additional guidance
	258 to 275	M1	for taking a correct reading from the graph that shows conversion of an amount in $ to £	
		M1	for a complete method eg attempts to read from the graph at using numbers that sum to 345 **and** finds the sum of their readings eg 6 × 50 + 45	Must be a complete method to get to 345
		A1	for answer in the range 258 to 275	Condone incorrect money notation if the meaning is clear

Q32.

Question	Working	Answer	Mark	Notes
		$y = \frac{1}{4}x + 5$	4	B1 for $m = -4$ M1 (indep) for gradient of perpendicular $= -\frac{1}{"-4"}$ or $\frac{1}{4}$ M1 (dep on previous M1) for substituting $x = -8, y = 3$ into $y = "\frac{1}{4}"x + c$ A1 for $y = \frac{1}{4}x + 5$ oe SC If M0 is scored then B2 for $y = -\frac{1}{4}x + 1$

Q33.

Question	Working	Answer	Mark	Notes
(a)		1, −3	B1	cao
(b)		−0.75, 2.75	B1	accept −0.7 to −0.8, 2.7 to 2.8
(c)		−2.8	B1	cao

Q34.

Question	Answer	Mark	Mark scheme	Additional guidance
	3.4	M1	for drawing a suitable tangent at $t = 6$	
		M1	for a full method to find the gradient of the tangent at t=6, eg 20 ÷ 5.8	Use of change in y over change in x
		A1	answer in the range 3.05 to 3.7	Answers of $\frac{10}{6}$ oe scores no marks

Q35.

Question	Answer	Mark	Mark scheme	Additional guidance
	$x^2 + y^2 = 80$	P1	for process to find gradient of tangent eg $\frac{10-0}{0--20}$ $(=\frac{1}{2})$ or for $20^2 + 10^2 (= 500)$ or start to method to find angle between tangent and x axis, eg $\tan\theta = \frac{10}{20}$	
		P1	for process to find gradient of normal/radius eg $\frac{-1}{"0.5"}$ $(=-2)$ or for $\sqrt{20^2 + 10^2}$ or $\sqrt{500}$ or 22.36... or 22.4 or completes process to find angle between tangent and x axis. eg $\theta = \tan^{-1}\left(\frac{10}{20}\right)$ $(=26.565...)$	
		P1	for equation of tangent eg $y = "0.5"x + 10$ oe or for equation of radius eg $y = "-2"x$ oe or for using similar triangles eg $\frac{r}{10} = \frac{20}{"\sqrt{500}"}$ or for $\sin("26.565...") = \frac{r}{20}$	
		P1	for process to find the x coordinate eg "0.5"x + $10 = "-2"x$ $(x = -4)$ or for $r = \frac{20}{"\sqrt{500}"} \times 10$ or $r = 20 \times \sin("26.565...")$	
		A1	oe	Accept $(4\sqrt{5})^2$ for 80

Q36.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	sketch	B1	for appropriate sketch which crosses the x axis at (2,0) and (4,0), minimum point at (3,−1) and end points at (1,3) and (5,3)	Allow some tolerance on the points if the intention is clear.
(b)	$y = g(-x)$	B1	cao	

Q37.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	0.008	B1	for 0.008 or 8×10^{-3}	May be awarded at any stage
(b)	50	M1	for conversion from km to m eg 180×1000 (= 180 000) **or** for conversion from hours to seconds eg $180 \div (60 \times 60)$ (= 0.05) **or** for conversion from km per hour to metres per second, eg $1000 \div (60 \times 60)$ (= 0.277...) (Accept $(60 \times 60) \div 1000$ (= 3.6))	
		M1	for a complete process eg $180 \times 1000 \div 3600$	
		A1	cao	

Q38.

Question	Working	Answer	Mark	Notes
	Volume = $\dfrac{5 \times 12}{2} \times 15$ Mass = $\dfrac{5 \times 12}{2} \times 15 \times 6.6$	2970	3	M1 $\dfrac{5 \times 12}{2} \times 15$ (=450) M1 (dep on 1st M1) '450'×6.6 A1 cao SC: If no marks awarded then award B1 for an answer of 5940

Q39.

5MB3H_01 November 2015

Question	Working	Answer	Mark	Notes
		1.01	3	M1 for 1.2×15 (= 18) or 1×250 clearly defined as mass M1 for $\dfrac{"18" + "250"}{15+250}$ A1 for 1.01(1...)

Q40.

Question	Working	Answer	Mark	Notes
(a)		$5n - 2$	B2	for $5n - 2$ oe
			[B1]	for $5n + k$, k may be 0]
(b)		No (supported)	C1	for No with evidence, e.g. $3 \times 4^2 = 48$, $\sqrt{48}$ is not an integer, he has multiplied by 3 first but should have squared first

Q41.

Question	Working	Answer	Mark	Notes
		22.6	3	M1 for $19.3^2 + 11.7^2$ or $372.49 + 136.89$ or 509.38 M1 for $\sqrt{19.3^2 + 11.7^2}$ or $\sqrt{509.38}$ A1 for answer in range 22.5 to 22.6

Q42.

PAPER: 5MB3H_01

Question	Working	Answer	Mark	Notes
		Perpendicular bisector	2	M1 for accurate line drawn without arcs, or appropriate arcs A1 accurate line and appropriate arcs drawn

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Q43.

Question	Working	Answer	Mark	Notes
(a)		Reflection in $x = 0$ or y-axis	2	B1 for reflection B1 for $x = 0$ or y-axis (NB: a combination of transformations gets B0)
(b)		Triangle (1, 0)(4, 0)(1, −2)	2	M1 for any correct rotation of 90° clockwise OR for any correct rotation about the point (0, 2) A1 for a triangle with vertices at (1, 0), (4, 0) and (1, −2)

Q44.

	Working	Answer	Mark	Notes
		Translation; $\binom{6}{-1}$	2	B1 for translation B1 for $\binom{6}{-1}$ NB: B0 if m ore than one transformation given

Q45.

	Working	Answer	Mark	Notes
	Q at (− 3, 1), (− 6, 1) (−5, 3) (− 3, 3) **R** at (−3, − 1), (−6, − 1), (−5, − 3) (−3, −3)	Rotation 180° about (−1, 0)	3	M1 for showing **R** correctly on the grid without showing **Q** or for showing **Q** and **R** correctly on the grid A1 for rotation of 180° A1 for (centre) (−1, 0) **Or** M1 for showing **R** correctly on the grid without showing **Q** or for showing **Q** and **R** correctly on the grid A1 for Enlargement Scale Factor −1 A1 for centre (−1, 0) **NB** Award no marks for any correct answer from an incorrect diagram or any Accuracy marks if more than one transformation is given
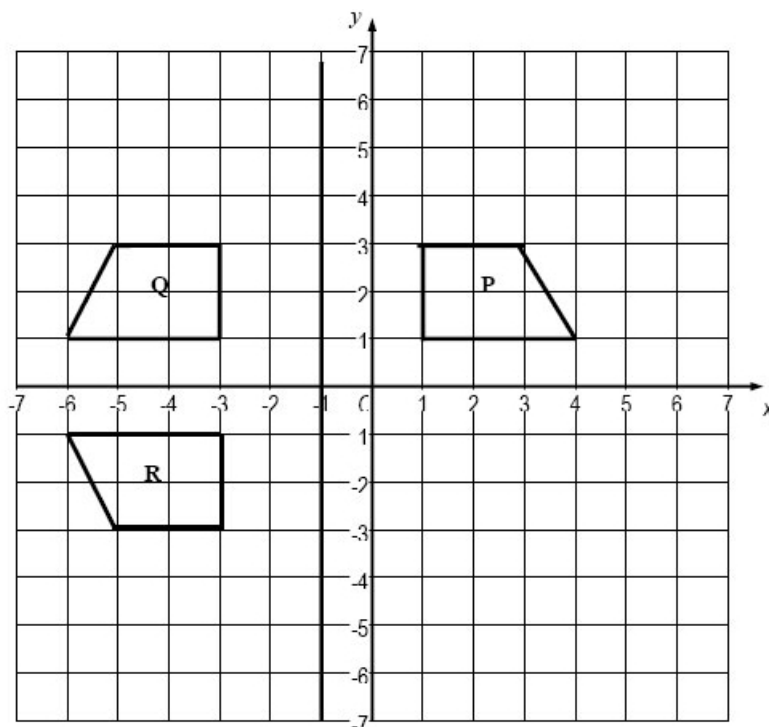
Q46.

	Working	Answer	Mark	Notes
			3	B3 for fully correct triangle (B2 for 2 vertices correct or enlargement scale factor 3 in wrong position or enlargement, centre *A*, with different scale factor) (B1 for 1 vertex correct or enlargement, not from *A*, different scale factor)

Q47.

Question	Working	Answer	Mark	Notes
(a)		**a** – 3**b**	1	B1 for **a** – 3**b** oe
(b)			4	M1 for (**NC** =) 2**a** – 2**b** oe
				M1 for (**NM** =) **b** + ½ "(**a** –3**b**)"
				A1 for ½ (**a** – **b**) oe and 2**a** – 2**b** oe
				C1 for **NC** is a multiple of **NM** (+ common point)
				OR
				M1 for (**NC** =) 2**a** – 2**b** oe
				M1 for (**MC** =) ½ "(**a** – 3**b**)"+ **a**
				A1 for ³⁄₂ (**a** – **b**)oe and 2**a** – 2**b** oe
				C1 for **NC** is a multiple of **MC** (+ common point)
				OR
				M1 for (**NM** =) **b** + ½ "(**a** –3**b**)"
				M1 for (**MC** =) ½ "(**a** – 3**b**)"+ **a**
				A1 for ½ (**a** – **b**)oe and ³⁄₂ (**a** – **b**) oe
				C1 for **NM** is a multiple to **MC** (+ common point)

Q48.

5MB3H/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		$p = 4$, $q = -10$	3	M1 for sight of $(x - 4)^2$ or $p = 4$ M1 for $(x - 4)^2 - 16 + 6$ A1 for $p = 4$, $q = -10$ OR M1 for $x^2 - 2px + p^2 + q$ or $-2p = -8$ or $p^2 + q = 6$ M1 for $-2p = -8$ and $p^2 + q = 6$ A1 for $p = 4$, $q = -10$
(b)		$(4, -10)$	1	B1 ft

Compiled by JustMaths – this is NOT a prediction paper and should not be used as such!

Q49.

Question	Working	Answer	Mark	Notes
	$\dfrac{-6 \pm \sqrt{6^2 - 4 \times 3 \times -2}}{2 \times 3}$ $(x+1)^2 - 1 - \dfrac{2}{3} = 0$	0.29 and -2.29	3	M1 for substitution of $a = 3$, $b = 6$, $c = -2$ into the formula or for completing the square (condone **one** sign error) M1 for $\dfrac{-6 \pm \sqrt{60}}{6}$ or $-1 \pm \sqrt{\dfrac{5}{3}}$ or in simplified form A1 for answers in the range 0.29 to 0.292 and -2.292 to -2.29

Q50.

5MB3H/01 June 2015

Question	Working	Answer	Mark	Notes
		85.6	4	M1 for $360 \div 5$ $(=72)$ M1 (dep) for $\dfrac{1}{2} \times 6^2 \times \sin"72"$ $(=17.12)$ M1 for completing full method to find total area of pentagon A1 for $85.5 - 85.6$ OR M1 for $360 \div 10$ $(=36)$ or $\dfrac{1}{2}(180 - 360 \div 5)$ $(=54)$ M1(dep) for eg $6 \times \sin"36" \times 6 \times \cos"36"$ $(=17.12)$ or $\dfrac{1}{2} \, 6 \times \sin"54" \times 6 \times \cos"54"$ $(=8.55)$ M1 for completing full method to find total area of pentagon A1 for $85.5 - 85.6$

Q51.

		Working	Answer	Mark	Notes
			15.0	3	M1 for $8^2 + 8^2 - 2 \times 8 \times 8 \times \cos 140$ M1 (dep) for correct order of evaluation **or** 226.(05...) A1 for answer in range $15.0 - 15.04$ OR M1 for $\dfrac{PR}{\text{SIN } 140} = \dfrac{8}{\sin\left(\left(\frac{180-140}{2}\right)\right)}$ M1 for $PR = \dfrac{8}{\sin\left(\left(\frac{180-140}{2}\right)\right)} \times \sin 140$ A1 for answer in range $15.0 - 15.04$ OR M1 for $8 \times \sin 70$ or $8 \times \cos 20$ M1 for $2 \times 8 \times \sin 70$ **or** $2 \times 8 \times \cos 20$ A1 for answer in range $15.0 - 15.04$

Q52.

Question	Working	Answer	Mark	Notes
		8.52	5	M1 for $\dfrac{BD}{\sin 45} = \dfrac{7.4}{\sin 80}$ oe M1 for $(BD =) \dfrac{7.4}{\sin 80} \times \sin 45 \ (= 5.3133..)$ M1 for $5.8^2 + '5.31'^2 - 2 \times 5.8 \times '5.31' \cos 100$ M1 (dep) for correct order of evaluation or 72.5(73...) A1 for $8.51 - 8.52$ OR M1 for $\dfrac{AD}{\sin(180 - 80 - 45)} = \dfrac{7.4}{\sin 80}$ oe M1 for $(AD =) \dfrac{7.4}{\sin 80} \times \sin(180 - 80 - 45) \ (= 6.15...)$ M1 for $7.4^2 + ('6.15' + 5.8)^2 - 2 \times 7.4 \times ('6.15' + 5.8) \times \cos 45$ M1 (dep) for correct order of evaluation or 72.5(7398...) A1 for $8.51 - 8.52$

Q53.

Question	Working	Answer	Mark	Notes
(a)		$(x + 1)(x + 4)$	2	B2 for $(x + 1)(x + 4)$ (B1 for $(x + a)(x + b)$ with one factor correct or $(x - 1)(x - 4)$ or $x(x + 4) + 1(x + 4)$ or $x(x + 1) + 4(x + 1)$)
(b)	$3x(2x + 5) - 1(2x + 5)$ $6x2 + 15x - 2x - 5$	$6x^2 + 13x - 5$	2	B2 for fully correct (B1 for 3 out of not more than 4 terms including signs or 4 terms correct ignoring signs)
(c)	$^{15}\!/_{30x} + ^{6}\!/_{30x} - ^{10}\!/_{30x}$	$^{11}\!/_{30x}$	2	M1 for attempt to use a correct common denominator with at least 2 correct equivalent fractions A1 for $^{11}\!/_{30x}$ oe

Q54.

Question	Working	Answer	Mark	Notes
		400 and correct assumption	4	M1 for partial working eg $\dfrac{60}{12}$ oe or 20% or $\dfrac{1}{5}$ seen or $80 \div 12 \ (= 6.66..)$ or $\dfrac{12}{80}$ oe M1 for complete method eg $\dfrac{80 \times 60}{12}$ or 80×5 or $6.66.. \times 60$ or $\dfrac{12}{60} = \dfrac{80}{n}$ oe or $80 \div 0.2$ oe A1 cao C1 for a correct mathematical assumption eg population has not changed overnight or mark which does not wear off or sample is random etc

Q55.

PAPER: 1MA0/2F

Question	Working	Answer	Mark	Notes
*		large carton with correct calculations	3	M1 for 1.60 ÷ 125 (= 0.0128) or 2.8 ÷ 225 (= 0.0124(4…) or 125 ÷ 1.60 (= 78(.125(g)) or 225 ÷ 2.80 (= 80(.35…g)) or any other calculation that could lead to a comparative figure M1 for 1.60 ÷ 125 (= 0.0128) **and** 2.8 ÷ 225 (= 0.0124(4…) or for 125 ÷ 1.60 (= 78(.125(g)) **and** 225 ÷ 2.80 (= 80(.35…g)) or for calculations that could lead to comparative figures for the 2 cartons C1 for correct comparative figures for both cartons leading to a correctly stated comparison. Accept any other method considered equivalent. Figures may be truncated or rounded as long as their method is clear.

Q56.

PAPER: 5MB3H_01

Question	Working	Answer	Mark	Notes
		4.5, −0.75 oe	3	M2 for $(2x − 9)(4x + 3)$ oe (M1 for $(2x ± 9)(4x ± 3)$) oe A1 for 4.5, −0.75 oe [SC: B1 for 4.5 and −0.75 oe, found by any other method]

Q57.

PAPER: 1MA0_2H

Question	Working	Answer	Mark	Notes
	$y (5y + 24) = 0$ $\dfrac{−24±\sqrt{(24^2)}}{10}$	$x = 6, y = 0$ $x = −3.6, y = −4.8$	5	M1 for substitution for elimination eg $(2y + 6)^2 + y^2 = 36$ M1 (dep on M1) for expansion eg $4y^2 + 12y + 12y + 36$ (3 out of 4 terms correct) A1 for $4y^2 + 24y + 36 + y^2 = 36$ oe M1 for a correct attempt to solve a 2 or 3 term quadratic equation eg by factorising or correct substitution into a quadratic formula A1 for $x = 6, y = 0$ and $x = −3.6$ oe, $y = −4.8$ oe SC: B1 (if M0 scored) for all 4 values mis-associated or one correct pair of values

Q58.

Paper: 5MB3H_01

Question	Working	Answer	Mark	Notes
		proof	4	B1 for $\overrightarrow{AM} = 0.5\mathbf{b}$ or $\overrightarrow{MC} = 0.5\mathbf{b}$ or $\overrightarrow{BC} = \mathbf{a}$ or $\overrightarrow{CX} = \mathbf{a}$ or $\overrightarrow{BX} = 2\mathbf{a}$ Note: This could be shown on the diagram or in a correct vector expression M1 for a correct relevant vector expression for $\overrightarrow{OM}$ or $\overrightarrow{MX}$ or $\overrightarrow{OX}$ eg $\overrightarrow{OM} = \overrightarrow{OA} + \overrightarrow{AM}$ or $\overrightarrow{OX} = \mathbf{b} + 2\mathbf{a}$ A1 for any two from $(\overrightarrow{OM}) = \mathbf{a} + 0.5\mathbf{b}$, $(\overrightarrow{MX}) = \mathbf{a} + 0.5\mathbf{b}$ and $(\overrightarrow{OX}) = \mathbf{b} + 2\mathbf{a}$ B1 for a fully correct proof, eg." $\overrightarrow{OX} = 2\overrightarrow{OM}$ so the vectors are parallel and have a common point O " OR (geometric proof) M1 for <OAM = <MCX or OA = CX and AM = CM A1 for <OAM = <MCX with reason (alternate angles) and OA = CX and AM = CM B1 for ΔOAM ≡ ΔXCM with reason, eg SAS B1 for correct proof, eg <AMO = <CMX with reason (vertically opposite angles)

Q59.

		Working	Answer	Mark	Notes
	(a)		10 and 18	2	B2 Two correct values (B1 one correct value)
	(b)		Bars at heights 3cm and 2cm	2	B2 for two correct bars (B1 for one correct bar)

Q60.

PAPER: 1MA0_1H

Question	Working	Answer	Mark	Notes
(a)		correct graph	2	M1 for 5 or 6 or 7 points plotted correctly at the ends of the intervals (overlay) A1 cao for correct graph with points joined by curve or straight line segments [SC: B1 if the shape of the graph is correct and 5 or 6 or 7 of their points are **not** at the ends but are plotted consistently within (10,20) (20,30) (30,40) etc.]
(b)		No with supporting figures	2	M1 for 0.1×200 (=20) **or** 0.9×200 (=180) **or** sight of 180 used on cf axis **or** $200 - 186$ (=14) A1 ft for correct decision with 20 and "9" **or** 20 and 14 **or** "age" from reading graph at 180 **OR** M1 for method to find percentage of workers who are over 65, eg $\frac{200-"191"}{200} \times 100$ (=4.5%) **or** method to find percentage of workers who are over 60 (from table), eg $\frac{200-186}{200} \times 100$ (=7%) or $\frac{200-190}{200} \times 100$ (=5%) A1 ft for correct decision with "4.5"% or 7% or 5%

Q61.

Question	Working	Answer	Mark	Notes
(a)		09 27	1	B1 cao
(b)		12	2	M1 for method to add 50 minutes to 09 35 (= 10 25) or method to find the difference between 09 35 and 10 13 (= 38) A1 cao

Q62.

PAPER: 1MA0/2F

Question	Working	Answer	Mark	Notes
(a)		25	1	B1 cao
*(b)		yes with correct comparative figures	3	M1 for method to calculate journey time travelling at 30 mph, eg $\frac{20}{30}$ (=0.66…) or 40 (mins) M1 (dep) for method to work out arrival time at home, (consistent units), eg 18 10 + "40 mins" (=18 50) C1 for yes with comparison of 40 minutes with 50 minutes or stating arrival time home as 18 50 **OR** M1 for method to calculate speed in order to get home by 1900 eg $20 \div \frac{50}{60}$ (= 24 mph) M1 (dep) for stating speed as 24 mph C1 for yes with supporting calculations showing speed as 24 mph