

Paper 5525_05				
No	Working	Answer	Mark	Notes
1	(a) $x^2 = \frac{108}{3}$	6	2	M1 ($x^2 =$) $\frac{108}{3}$ (=36) or 36 seen A1 cao 6 or -6 or both. Also accept $\sqrt{36}$
	(b) $2 \times 54 = 2 \times 2 \times 27$	$2 \times 2 \times 3 \times 3 \times 3$	3	M1 for attempt at continual prime factorisation (at least 2 correct steps); could be shown as a factor tree. A1 all 5 correct prime factors and no others A1 $2 \times 2 \times 3 \times 3 \times 3$ or $2^2 \times 3^3$ oe
2	(a)	5, -1, 1	2	B2 all three correct (B1 one or two correct)
	(b)		2	B1 ft points plotted correctly ± 1 full square B1 smooth curve through their plotted points provided at least B1 awarded in (a).
	(c)	3.6, -0.6	2	B2 for $x= 3.4$ to 3.8 and -0.8 to -0.4 otherwise ft ± 1 full square depends on at least B1 in (b) (B1 for one value or line $y= 3$ seen)
3	10.5×5	52.5g	2	M1 10.5×5 A1 cao
4		overlay	4	M1 quarter "circle" drawn centre A inside rectangle (ignore lines outside the rectangle) A1 radius 4 cm ± 2 mm B1 line drawn 1 cm ± 2 mm from DC. B1 ft (dep on two loci attempts drawn) region shaded
5		$\frac{26}{60}$	2	M1 $(16 + 10) \div '60'$ or 26 seen or $\frac{16}{60}$ A1 oe
6	$\frac{400 \times 6}{0.2} = \frac{2400}{0.2}$	12000-12500	3	M1 two of 400, 6, 0.2 A1 $\frac{2400}{0.2}$ or $\frac{2460}{0.2}$ or 2000×6 or 2050×6 or 400×30 or 410×30 A1 answer in range 12000 – 12500

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7 (a)		126.5g	1	B1 cao										
(b)		127.5g	1	B1 127.5 or 127.49 or 127.49.... or 127.499										
8	How many pizzas have you eaten in the last week? <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>More than 3</td> </tr> </table>						0	1	2	3	More than 3	Include a time period Proper response boxes	2	B1 include a time period B1 at least 3 numeric response boxes
0	1	2	3	More than 3										
9 (a)		4.56×10^5	1	B1 cao										
(b)		3.4×10^{-4}	1	B1 cao										
(c)		1.6×10^8	1	B1 cao										
10 (a)		$(x + 2)(x + 4)$	2	M1 $(x \pm 2)(x \pm 4)$ A1 cao										
(b)		-2, -4	1	B1 ft from (a) or -2, -4										
11 (a)	SF = 1.5	39 cm	2	M1 SF = $\frac{12}{8}$, $\frac{8}{12}$, 1.5, 0.6 ... oe A1 cao										
(b)	$45 \times \frac{8}{12}$	30 cm	2	M1 $45 \times \frac{8}{12}$, $45 \div \frac{12}{8}$ oe A1 cao										
12 (a)		$x = 3, y = 2$	1	B1 cao										
(b)		(4,2), (5,1) (5,2), (5,3)	3	B3 all correct and none incorrect B2 at least 2 correct and not more than 4 points B1 line $x = 6$ drawn or one point correct										

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13 (a)	He has taken it from this year instead of last year		1	B1 Reason or appropriate calculation
13 (b)	$\frac{240}{1.2}$	200	2	M1 $\frac{240}{1.2}$ oe A1 cao
14 (a)		12, 33, 69, 92, 100	1	B1 cao
14 (b)			2	B1 ft for 4 or 5 points plotted correctly ± 1 full 2 mm square at the end of interval dep on sensible table (condone one addition error) B1 dep for points joined by curve or line segments provided no gradient is negative . Ignore any point of graph outside range of their points. SC: B1 if 4 or 5 points plotted not at end but consistent within each interval and joined .
14 (c)		62- 64 hours	2	B1 62-64 otherwise ft from cumulative freq graph B1 for hours
15 (a)	90	90°	2	B1 90° B1 angle in semi circle (= 90°)
15 (b)	$70 \div 2$	35°	2	B1 35° or 325° B1 angle at centre = twice angle at circumference OR B1 angle on a straight line <i>with</i> isosceles triangle

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16 (a)	$T = kM$ $k = \frac{600}{250}$ $T = \frac{600}{250} \times 400$	960	3	M1 for $T = km$ or $\frac{600}{250} = \frac{T}{400}$ oe M1 for $(k =) \frac{600}{250}$ (=2.4) or $(T =) 400 \times \frac{600}{250}$ A1 cao
(b)	$T = \frac{K}{P}$ $T = \frac{1400 \times 360}{900}$	560	3	M1 for $T = \frac{K}{P}$ or $\frac{T}{1400} = \frac{360}{900}$ oe M1 for $(K =) 1400 \times 360$ or $360 = \frac{K}{1400}$ or $(K =) 504000$ or $(T =) \frac{360 \times 1400}{900}$ oe A1 cao
17 (a)		$\begin{pmatrix} 4 \\ 3 \end{pmatrix}$	2	M1 subtraction of coordinates or position vectors or $\begin{pmatrix} 4 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 3 \end{pmatrix}$, where x and y are integers A1 cao SC: B1 for $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$ or $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$
(b)	$R = (6, 10), S = (2, 7)$ $\rightarrow \begin{pmatrix} 2 \\ 7 \end{pmatrix} - \begin{pmatrix} 6 \\ 6 \end{pmatrix}$ $QS = \begin{pmatrix} 2 \\ 7 \end{pmatrix} - \begin{pmatrix} 6 \\ 6 \end{pmatrix}$	$\begin{pmatrix} -4 \\ 1 \end{pmatrix}$		B2 for $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$ B1 for $\begin{pmatrix} -4 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 1 \end{pmatrix}$, where x and y are integers

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18 (a)	$\frac{3x}{x} + \frac{3x}{2x} = 2x$	$x = \frac{9}{4}$	2	M1 for $\frac{6+3}{2x}$ or $\frac{3}{x} \times x + \frac{3}{2x} \times x = 2 \times x$ or $\frac{6x+3x}{2x^2} = 2$ A1 $\frac{9}{4}$ oe
(b)	$(y-1)^2 = \frac{9}{4}$ $y-1 = \pm \frac{3}{2}$	$y = \frac{5}{2}, -\frac{1}{2}$	3	M1 $(y-1)^2 = \frac{9}{4}$ "or $4y^2 - 8y - 5 = 0$ oe A1 cao $\frac{5}{2}$ oe A1 cao $-\frac{1}{2}$ oe
19 (a)		Heights 24,32	2	B1 cao for bar from 15 – 17.5, height 24 × 2mm squares B1 cao for bar from 17.5 – 20, height 32 × 2mm square
(b)		Freqs 40, 20, 15	2	B2 cao for all 3 correct (B1 for any 1 or 2 correct)
(c)	Area up to 12.5 = 220x Area above 21 = 156x Frequency = $\frac{156x}{220x} \times 110$	78	3	M1 for attempt to find area upto 12.5 and area above 21 consistently M1 for $\frac{156}{220} \times 110$ or $\frac{6.24}{8.8} \times 110$ or $156 \times \frac{110}{220}$ oe A1 78 cao SC: If no marks earned B1 for $2\text{mm}^2 = 1$ person oe

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20	(a)	2	1	B1 cao
	(b)	1.5	1	B1 1.5 oe
	(c)	$16\sqrt{2}$	2	M1 $(\sqrt{8} =) \sqrt{4 \times 2}$ or $\sqrt{2} \times \sqrt{2} \times \sqrt{2}$ or $(2^3)^{\frac{3}{2}}$ A1 for $16\sqrt{2}$ (accept $m = 16$)
	(d)	$\frac{\sqrt{2}}{32}$	2	M1 $\frac{1}{8\sqrt{8}} \times \frac{\sqrt{8}}{\sqrt{8}}$ or $\frac{1}{8\sqrt{8}} \times \frac{8\sqrt{8}}{8\sqrt{8}}$ or $\frac{1}{16\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$ oe or $\frac{1}{8\sqrt{8}} \times \frac{\sqrt{2}}{\sqrt{2}}$ A1 for $\frac{\sqrt{2}}{32}$ (accept $p = 32$)
21	(a)		3	B1 for either $BC = CD$ or $BC = CE$ $CF = CE$ or $CF = CD$ B1 for $BCF = DCE = 150^\circ$ or correct reason
	(b)		2	B1 for proof of congruence B1 $BF = EG$ or $BF = ED$ B1 fully correct proof
22		$a = \frac{n^2 - nP}{P - 1}$	4	M1 $(n + a)P = n^2 + a$ M1 $nP + aP = n^2 + a$ M1 $a(P - 1) = n^2 - nP$ or $a(1 - P) = nP - n^2$ A1 for $a = \frac{n^2 - nP}{P - 1}$ oe

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23	(a)	$(2x - 3)(x - 2)$	2	B2 cao B1 $(2x - a)(x - b)$, where $ab = 6$
	(b)(i)	$(n - a)(n + a - (n - a))$ or $n^2 - a^2 - (n^2 - 2an + a^2)$		M1 for $(n - a)(n + a)$ seen A1 cao or M1 for $n^2 - 2an + a^2$ seen A1 cao
	(b)(ii)	a and $n - a$ are integers $2 \times n \times (n - a)$ is even	4	M1 dep for identifying $n - a$ as an integer or multiplying by 2 gives an even number or M1 dep for identifying an or a^2 as an integer, or for the difference of two even numbers is an even number A1 correct proof
24	(a)(i)	$(0, -1)$	3	B1 cao
	(ii)	$(2, -3)$		B1 cao
	(iii)	$(1, -1)$		B1 cao
	(b)	$y = f(-x)$	1	B1 cao
	(c)	Translation by + 2 parallel to the y axis	1	B1 for translation by $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$