

Paper 5525/05				
No	Working	Answer	Mark	Notes
1	$0.15 \times 300 =$	45	2	M1 for 0.15×300 A1 cao
2		$30 < C \leq 40$	2	M1 evidence of attempt to find the position in which the median lies (eg counting or $\sum \frac{f}{2}$ or $\sum \frac{f+1}{2}$) A1 cao NB: $\frac{33}{2}$ leading to correct answer M1A1 but leading to 20-30 award M1A0; also $(33+1) \div 2$
3	$1785 \times 2 \div 5 =$	£714	2	M1 1785×2 or $1785 \div 5$ or $1785 \div "(2+3)"$ A1 cao Accept £714 and £1071 given.
4	(a) $x^2 - xy - xy + y^2$	$x^2 - 2xy + y^2$	2	M1 for 3 terms correct with sign, or 4 terms correct ignoring signs, or $x^2 - 2xy - y^2$ A1 cao
	(b) $aq - ac = d$ $aq = ac + d$	$\frac{ac+d}{a}$	3	B1 $aq - ac$ M1 for $+ac$ or $\div a$ both sides A1 oe OR B2 $q - c = \frac{d}{a}$ B1 $q = \frac{d}{a} + c$, $q = d \div a + c$ oe

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5	(a)		2	B2 line through C, at least 50mm long, fully within the overlay. (B1 at least 25mm of line in the overlay lines, or fully in the overlay and less than 50mm long)
	(b)		2	B2 solid shaded circle 28-32 mm from B (B1 attempt to draw a shaded circle around B, any radius, OR unshaded circle within tolerance, or shaded sector correct tolerance)
6	Eg $6 \times 300 \div 0.5 =$ or $10 \times 312 =$	3000-3750	3	B2 for 6, 300 and 0.5 seen, or 10 & 300, or 10 & 312, or 10 & 310, or 1800 & 0.5, or 1500 & 0.5 or 1860 & 0.5 or 1872 & 0.5 (B1 for one of 6, 300, 0.5, 10 or 600 seen) B1 cao
7	(a)		2	M1 for $x+10+2x+x+90+(x+20) = 360$ or $5x+120$ or an indication of adding the terms on the paper A1 cao
	(b)	58	3	NB: algebra seen in (b) can attract marks in (a) M1 for simplifying to at least " $5x+120 = 360$ " (their equation) A1 $x = 48$ or 48 seen cao B1 ft (adding 10) NB: M1 A1 can be awarded if this work is seen in (a)
8	$2 \times 3.14 \times 10 = 62.8$ (62.8-62.9) $62.8 \div 2 = 31.4$ (31.4-31.5) $31.4 + 20 =$	51.4-51.5	3	M1 for $2 \times 3.14 \times 10$ or $\pi \times 20$ or $2 \times \pi \times 10$, or $3.14 \times 20/2$ or or $\pi \times 20/2$ or $2 \times \pi \times 10/2$ or 62.8 seen A1 for 31.4-31.5 seen for arc length B1 ft (indep) for " 31.4 " + 20 or 51.4-51.5 NB: allow use of 3.142, 3.1, 3, 22/7 instead of 3.14
9	(a)	4.0×10^7	1	B1 cao
	(b)	0.000014	1	B1 cao
	(c)	3.0×10^{14}	2	B2 cao accept 3×10^{14} (B1 for 30×10^{13} or $5 \times 6 \times 10^{4+9}$) SC: B1 for correct answer as an ordinary number

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10	$QRP = 57^\circ$ $x = 2 \times 57 =$	114°	3	M1 for $QOP=2 \times 57^\circ$ or $QRP=57^\circ$ in working or on the diagram. A1 114° cao B1 angle at circumference is half angle at centre
11		$1^{st}, 4^{th}$	2	B1 for 1^{st} B1 for 4^{th} NB: -B1 for each additional box ticked, to a minimum of 0.
12	(a) $\frac{2}{5}, \frac{5}{7}, \frac{2}{7}, \frac{5}{7}$		2	B1 for $\frac{2}{5}$ in the correct place B1 for $\frac{5}{7}, \frac{2}{7}, \frac{5}{7}$ all in the correct places
	(b) $\frac{3}{5} \times \frac{5}{7} + \frac{2}{5} \times \frac{2}{7}$	$\frac{19}{35}$	3	M1 for $(\frac{3}{5} \times \frac{5}{7})$ or $(\frac{2}{5} \times \frac{2}{7})$ M1 (dep) for $(\frac{3}{5} \times \frac{5}{7}) + (\frac{2}{5} \times \frac{2}{7})$ A1 cao
13	(a) Reason		1	B1 Reason eg fall is less than 100%
	(b) $0.8^2 = 0.64$ $(100\% - 20\%)^2$	0.64	2	B1 sight of 0.8 B1 cao
14	(a) Box plot drawn		3	B1 for median marked at 32.0 – 33.5 B1 for position of box with its ends at 24.0 - 26.5 and 37.0 - 39.5 B1 for position of ends of whiskers at 5 and 47
	(b) Reasons given		2	B1 (ft) for “greater median” for part 2 B1 (ft) for “smaller inter-quartile range” for part 2 Accept comparisons of lower and upper quartile.

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15	(a) $-4 = 2a - 3$ where a is the required x coordinate	$-\frac{1}{2}$	2	M1 for $-4 = 2a - 3$ or x shown as $\frac{1}{2}$ A1 $-\frac{1}{2}$ or $(-\frac{1}{2}, -4)$
	(b) $y = 2x + c$ $4 = 2 \times 3 + c, c = -2$	$y = 2x - 2$	3	M1 for $y = 2x + c$ ($c \neq -3$) or gradient = 2 M1 (indep) attempt to subs $x=3, y=4$ into any linear equation A1 for $y = 2x - 2$ SC B2 for $2x-2$
	(c)	$y = 3 - \frac{1}{2}x$	1	B1 cao
16	$\frac{130}{750} \times 60$	10 or 11	3	M1 $130 / (190+145+145+140+130) (\times 100\%)$ M1 $\frac{130}{'750'} \times 60$ or $17.3\% \times 60$ A1 10 or 11
17	(a)	(180,0)	1	B1 cao
	(b) Sketch of $y = \sin 2x^\circ$		2	M1 for a sine curve stretched by SF2 or $\frac{1}{2}$ parallel to x - axis A1 for correct curve between 0 and 180 or 0 and 360
18	(a) $5 \times 5 \times 10 = 250$ $5 \times 5 \times 6 \div 3 = 50$	300	3	M1 for either $5 \times 5 \times 10$ or $5 \times 5 \times 6 \div 3$ M1 (dep) for ' $5 \times 5 \times 6 \div 3$ ' + ' $5 \times 5 \times 10$ ' A1 cao
	(b) Area scale factor is 30^2 $290 \times 30^2 = 261000 \text{ cm}^2$ $261000 \div 10000$	26.1	3	B1 for 30^2 or 900 M1 for 290×30^2 or digits 261 seen A1 cao
19	Straight line through (0,1) and (1,3)	$x=1.8$ $y=4.7;$ $x = -2.6$ $y = -4.2$	3	M1 draw $y = 2x + 1$ or any st line with positive gradient thro' (0,1) or any line with gradient 2. Must cut circle at least once. A1 first solution (± 1 square, ft but dep on a single straight line) A1 cao second solution (± 1 square)

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20	(a) $\frac{1}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}}$	$\frac{\sqrt{7}}{7}$	2	M1 $\frac{1}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}}$ A1 cao
	(b) (i) $3+15+2\sqrt{(3 \times 15)}$ $18+2\sqrt{45}$ $18+6\sqrt{5}$	$18+6\sqrt{5}$	5	M1 for $(\sqrt{3})^2 + (\sqrt{15})^2 + \sqrt{3} \times \sqrt{15} + \sqrt{15} \times \sqrt{3}$ A1 $18+2\sqrt{45}$ B1 for $18+6\sqrt{5}$
	(ii) $(3+\sqrt{5})^2 = 9+5+6\sqrt{5}$ $=14+6\sqrt{5}$ $(\sqrt{3}+\sqrt{15})^2 - (3+\sqrt{5})^2$ $=18+6\sqrt{5} - (14+6\sqrt{5}) = 4$	2		M1 for correct expansion of $(3+\sqrt{5})^2$ to $3^2 + (\sqrt{5})^2 + 3\sqrt{5} + 3\sqrt{5}$ A1 cao
21	(a) (i)	$27x^6y^3$	4	B2 cao (B1 for x^6y^3 or $27x^6$ or $27y^3$ in a product)
	(ii)	$\frac{t^6}{4}$		B2 cao B1 for $\frac{1}{4}$ in a product or t^6 in a product (B1 for $\frac{1}{(2t^{-3})^2}, \left(\frac{2}{t^3}\right)^{-2}$)
	(b) (i) $x^2 - 4x + 15$ $= (x-2)^2 - 4 + 15$ $= (x-2)^2 + 11$	$p = -2$ $q = 11$	3	M1 for sight of $(x-2)^2$ A1 for $(x-2)^2 - 4 (+15)$ A1 for $p = -2$ and $q = 11$

No	Workings	Answer	Mark	Notes
22	<p>(a)</p> <p>(b)</p> <p>(c) $3(x^2-x) = 4-4x$ $3x^2 + x - 4 = 0$ $(3x + 4)(x - 1) = 0$ $x = 1$ or $x = -\frac{4}{3}$ Subs to get $y=0$ or $y=9\frac{1}{3}$</p>	<p>(0,2) (1,0) (2,0)</p> <p>(1,0)</p> <p>$\left(-\frac{4}{3}, \frac{28}{3}\right)$</p>	<p>3</p> <p>1</p> <p>5</p>	<p>B1 for graph translated through $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ or $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$</p> <p>B1 for y intercept at $(0, 2) \pm 2$ mm</p> <p>B1 for x intercept at $(1, 0)$ and $(2, 0) \pm 2$ mm</p> <p>B1 correct sketch showing stretch SF3 parallel to the y-axis</p> <p>M1 for equating the RHS of each equation</p> <p>M1 for reduction to 3 term quadratic (= 0)</p> <p>M1 for $(3x \pm a)(x \pm b)$ (=0) with $ab = -4$</p> <p>or $x = \frac{-1 \pm \sqrt{1^2 - 4 \times 3 \times (-4)}}{2 \times 3}$, allowing sign errors in b and c.</p> <p>A1 for $(1, 0)$</p> <p>A1 for $\left(-\frac{4}{3}, \frac{28}{3}\right)$ oe</p> <p>SC B1 for $(1, 0)$ no marks awarded previously</p> <p>SC 4/5 if the correct algebra is used to find the two correct x values, but the two y values are not found or are incorrect</p>
23	<p>$(2m + 1)^2 = 4m^2 + 4m + 1$ $(2n + 1)^2 = 4n^2 + 4n + 1$ Sum = $4m^2 + 4n^2 + 4m + 4n + 2$ $= 4(m^2 + n^2 + m + n) + 2$</p>		3	<p>B1 for $(2m + 1)^2$</p> <p>B1 for sum of correct expansion of 2 correct expressions for different odd squares</p> <p>B1 fully correct answer including the factor 4, and a clear remainder of 2</p> <p>SC B1 for $(n + 2)^2 + n^2$ oe</p>

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24	<p>(a) Angle $BDX = \text{angle } ADC = 90^\circ$ Angle $BXD = \text{angle } ACD = 60^\circ$ Hence similar</p> <p>(b) $\frac{XD}{DC} = \frac{BD}{AD}$, $DC = BD = 1$</p>		<p>2</p> <p>3</p>	<p>B2 for 2 of (Angle $BDX = \text{angle } ADC$, Angle $BXD = \text{angle } ACD$, angle $DAC = \text{angle } DBX$) B1 for 1 of the above</p> <p>M1 $\frac{XD}{DC} = \frac{BD}{AD}$ or $\frac{XD}{BD} = \frac{DC}{AD}$ or a statement that ACD is an enlargement of BDX, scale factor $\sqrt{3}$</p> <p>A1 $\frac{XD}{1} = \frac{1}{\sqrt{3}}$</p> <p>A1 $XD = \frac{1}{\sqrt{3}}$</p>