Paper 5525/05					
No		**Working**	**Answer**	**Mark**	**Notes**
1		70/5 = 14	Cheese 28 Topping 42	3	M1 for 70/5 or 5 parts = 70 or 14 seen in a correct context M1 for "14" × 2 or "14" × 3 (implied by 28 or 42) A1 for 28 and 42 cao (SC B1 for 14, 21 on answer line without working)
2		$12\frac{1}{2} \div \frac{5}{8}$ $\frac{25}{2} \times \frac{8}{5}$	20	3	M1 for $12\frac{1}{2}$ correctly written as an improper fraction M1 (indep) for $\times \frac{8}{5}$ A1 for 20 oe
3	(a)		$pq - p^3$	1	B1 oe accept $p \times q - p \times p^2$ or better
	(b)	$15p + 10 - 10p + 6$	$5p + 16$	2	B2 for $5p + 16$ oe (B1 for any two terms correct from 15p, +10, -10p, +6
4	(a)		4×10^7 0.000 03	2	B1 cao B1 cao
	(b)	12×10^2 1.2×10^3	1.2×10^3	2	M1 for 12×10^2 or 1200 ft from "(a)" A1 for 1.2×10^3 ft
5	(a)	$\frac{180 - x}{2}$ or $(180 - x) \div 2$	$\frac{180 - x}{2}$	2	M1 for $(180 - x)$ seen A1 for fully correct expression (accept $\frac{(180 - A)}{2}$)
	(b)	$3p + q = 11$ $p + q = 3$ Subtract $2p = 8$	$p = 4$ $q = -1$	3	M1 for intention to subtract M1 (dep) for substituting found value into either equation A1 for p=4, q=−1
6		360 ÷ 6 = 60º	60º	2	M1 for 360 ÷ 6 or (180 – 720 ÷ 6) A1 for 60º (SC B1 if M0 awarded for 120 seen)

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7		Construct rt.angle at *A* Bisect rt. Angle Draw correct angle		3	B1 (indep) for correct construction of right angle (arcs needed) B1 (indep) for correct method of bisecting right angle (arcs needed) or right angled isosceles triangle constructed B1 (dep on one of previous B1) for $45° \pm 2°$ (SC(B1 after B0 awarded $45°$ with no arcs and $90°$ angle seen))
8		½ × 4 × 3 × 7	42 cm³	4	M1 for ½ × 4 × 3 or attempt at area of triangle (accept 4×3) M1 for "their area" × 7 or where 7 is part of a triple product A1 for 42 cao B1 for cm³
9	(a)(i)		x^4	1	B1 cao
	(ii)		y^{12}	1	B1 cao
	(b)		$t^2 + 2t - 8$	2	B2 for fully correct (B1 for 3 out of 4 terms from $t^2 + 4t - 2t - 8$)
	(c)		-2, –1, 0, 1, 2, 3	2	B2 for fully correct (B1 for -2, –1, 0, 1 , 2, 3 with either–2 omitted or 4 included, or both, or any five integers correct only and no incorrect integers)
	(d)(i)		$\frac{1}{6}$	1	B1 cao accept $\pm\frac{1}{6}$ or $-\frac{1}{6}$
	(ii)	$27^{\frac{2}{3}} = (3)^2$	9	1	B1 cao

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10	(a)			3	B3 if fully correct (B2 for 2 lines and appropriate shading ft from their lines or for 3 lines correct) (B1 for 1 line correct)
	(b)		(2,2), (2,3), (2,4), (3,3)	2	B2 for all 4 correct with no extras (B1 ft for 2 points correct from their region)
11		$D - kt^2 = ut$ $u = \frac{D - kt^2}{t}$	$\frac{D - kt^2}{t}$	2	B2 for $\frac{D - kt^2}{t}$ oe (B1 for $\frac{D}{t} = \frac{ut + kt^2}{t}$ or $D - kt^2 = ut$ or one of two steps correct)
12	(a)		44,100,134,153,160	1	B1 cao
	(b)			2	B1 ft for at least 4 of 5 points plotted correctly ± ½ sq at end of interval dep on sensible table (condone 1 addition error) B1 ft (dep on previous B1) for points joined by curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (SC B1 if 4 or 5 pts plotted not at end but consistent within each interval and joined)
	(c)	Median 30 – 32 IQR 40 – 24	30 to 32 15 to 18	3	B1 ft from their cf graph $\pm \frac{1}{2}$ sq M1 ft from their cf graph identifying "120" and "40" A1 ft ± 1sq
	(d)			2	B2 if fully correct B1 for box with median or quartiles or whiskers correct

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13	(a)	90 –35 = 55º Angle in a semi-circle = 90º	55º	2	B1 for 55º B1 for (angle in) a **semi-circle** = 90º
	(b)	90 – "55"	35º	1	B1 for 35º ft
	(c)	180 - 2×35 = 110º	110º	2	M1 for complete method or for twice "(a)" A1 cao Candidates may choose to use Isosceles triangles or Angle subtended at centre is twice angle subtended at circumference
14		$x^2 + (2x)^2 = 25^2$ $5x^2 = 625$ $x^2 = 125$ $x = \sqrt{125}$ $A = \sqrt{125} \times 2\sqrt{125}$	250 cm²	3	M1 for $x^2 + (2x)^2 = 25^2$ or using Pythagoras with x and $2x$ or $5x^2 = 625$ M1 for $x = \sqrt{125}$ or for A = "$\sqrt{125}$" × "$2\sqrt{125}$" or $2 \times$ "125" A1 for 250 cao
15	(a)	*Angle* PQS = QSR Angle RQS = PSQ *SQ* is common Triangles are congruent ASA		3	B1 for 1 condition + reason B1 for 2nd condition + reason B1 for 3rd condition + reason + statement of congruency
	(b)	Opposite angles of parallelograms are equal. 2 obtuse angle added are > 180º therefore they cannot add up to 180 therefore the shape cannot be cyclic		2	B1 for states P and R are both obtuse B1 sum greater than 180 for angles *P* and *R* or less than 180 for angles *Q* and *S*
16	(a)		40, 60, 56, 32	2	B2 for all frequencies correct (B1 for any 1 frequency correct)
	(b)			3	B1 for Frequency density label or appropriate units B2 for 4 correct histogram bars $\pm \frac{1}{2}$ sq (B1 for 2 bars correct)

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17	(a)	$\frac{6}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{2} =$	$3\sqrt{2}$	2	M1 for sight of multiplying top and bottom by $\sqrt{2}$ or $\sqrt{\frac{36}{2}}$ A1 for $3\sqrt{2}$ oe
	(b)	$\frac{1}{2} \times \frac{6}{\sqrt{2}} \times \frac{6}{\sqrt{2}} = \frac{36}{4} =$	9	2	M1 for $\frac{1}{2} \times \frac{"6"}{\sqrt{2}} \times \frac{"6"}{\sqrt{2}}$ oe ft where $\frac{6}{\sqrt{2}}$ is in form $a\sqrt{b}$ where $\sqrt{b}$ is irrational A1 for 9 cao
18			D *A* *B* C	2	B2 for all correct (B1 for any 2 correct)
19	(a)	$5n$		1	B1 cao
	(b)(i)	$5n + 5(n\pm1)$ $10n \pm 5$ $5(2n \pm 1)$ Both 5 and $2n \pm 1$ are odd		2	M1 for $5n + 5(n\pm1)$ or $10n \pm 5$ or for $5(2n \pm 1)$ A1 for stating both 5 and $2n \pm 1$ are odd and odd × odd = odd oe
	(ii)	$5n \times 5(n\pm1)$ $25n(n\pm1)$ 25 is odd, one of n or $n \pm 1$ is odd so odd × even × odd = even		3	M1 for $5n \times 5(n\pm1)$ A1 for realises that one of n and $n\pm1$ will be even or considers $5n$ or $5(n\pm1)$ for both odd and even A1 for establishing correct result oe (SC if M0, MO awarded in part (b) B1 for using in b(i) or (ii) a numerical argument with more than 2 examples) (SC for $5n$ and $5n\pm1$ used B1 in (i) and B1 in (ii) for fully reasoned argument)

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20	(a)		a = 2, b = -1	2	B1 cao B1 cao
	(b)		0,234,360, 594,720	2	B2 for all 5 tolerance of ± 5° on 234 and 594 (B1 for 3)
	(c)	2 – (0 – 1)		2	M1 for "a" – (0 + "b") or using 90º A1 for 3 cao
21	(i)	$\overrightarrow{PS} = ½ (\mathbf{q} - \mathbf{p})$ $\overrightarrow{OS} = \mathbf{p} + ½ (\mathbf{q} - \mathbf{p})$	½ (**p** + **q**)	3	M1 for realising that $\overrightarrow{OS} = \overrightarrow{OP} + \overrightarrow{PS}$ or $\overrightarrow{OS} = \overrightarrow{OQ} + \overrightarrow{QS}$ or $\overrightarrow{OS} = \overrightarrow{OR} + \overrightarrow{RS}$ M1 for $\overrightarrow{PS} = \frac{1}{2}(\mathbf{q} - \mathbf{p})$ or $\overrightarrow{QS} = \frac{1}{2}(\mathbf{p} - \mathbf{q})$ A1 for $\frac{1}{2}(\mathbf{p} + \mathbf{q})$ or unsimplified correct answer
	(ii)	$\overrightarrow{RS} = \overrightarrow{RP} + \overrightarrow{PS}$ $\overrightarrow{RS} = ½ \mathbf{p} + ½(\mathbf{q} - \mathbf{p})$ $\overrightarrow{RS} = ½ \mathbf{q}$ $\overrightarrow{OQ} = \mathbf{q}$ Therefore RS is parallel to *OQ*		2	B1 for $\overrightarrow{RS} = ½ \mathbf{q}$ B1(dep) for RS parallel to *OQ* or compares **q** and ½ **q**

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22		$2(x - 1) + 3(x + 1) = 5$ $2x – 2 + 3x + 3 = 5$ $5x + 1 = 5$ $5x = 4$	$x = 0.8$	4	M1 for attempts to multiply by a common denominator M1 for attempting to multiply out the expression (1 numerator must be correct on LH side) A1 for correct linear expression A1 for 0.8 oe
23	(a)(i)		$\frac{1}{3}\pi x^2$	1	B1 for $\frac{1}{3}\pi x^2$ oe
	(ii)		$\frac{2}{3}\pi x$	1	B1 for $\frac{2}{3}\pi x$ oe
	(b)	$1/3\pi \times (1/3x)^2 \times h = 3 \times 1/3\ \pi x^2$ $\pi \underline{h\, x^2} = \pi x^2$ 27	$h = 27$	3	M1 for $\frac{1}{3}\pi r^2 h = 3\pi r x$ M1 for $2\pi r = \frac{2}{3}\pi x$ or $\pi r x = \frac{\pi x^2}{3}$ or $r = \frac{1}{3}x$ A1 for 27 cao