

## Paper 5523/03

No	Working	Answer	Mark	Notes
1	(a) $\begin{array}{r} 245 \\ 36 \times \\ \hline 1470 \\ 7350 \\ \hline 8820 \end{array}$ (b) $27.30 \div 0.65$ $2730 \div 65$ (c) $70/5 = 14$	£88.20  42  Cheese 28 Topping 42	3  3  3	M1 for complete method with relative place value correct, condone one error in a single digit multiplication A2 cao (A1 for either "8820" or a correct conversion of their total into pounds) M1 for intention to divide £27.30 by 65p M1 for complete method for dividing £27.30 by 65p, condone one arithmetic error A1 for 42 cao M1 for 70/5 or 5 parts = 70 or 14 seen in a correct context M1 for "14" $\times$ 2 or "14" $\times$ 3 (implied by 28 or 42) A1 for 28 and 42 cao (SC B1 for 14, 21 on answer line without working)
2	$2 \div 100 \times 60\,000$ $1 \div 100 \times 20\,000$ Total = £1400	£1400	4	M1 for $2 \div 100 \times 60\,000$ or $2 \div 100 \times 80000$ A1 for 1200 or 1600 M1 for intention to find 1% of 20000 A1 for 1400 cao
3	(a) $\frac{1}{2} + \frac{1}{6} = \frac{4}{6}$ $1 - \frac{4}{6}$ (b) $12 \frac{1}{2} \div \frac{5}{8}$ $\frac{25}{2} \times \frac{8}{5}$	$\frac{1}{3}$  20	3  3	M1 for correctly writing both fractions to a common denominator A1 for $\frac{2}{3}$ oe B1 ft for $1 - \frac{2}{3}$ M1 for $12 \frac{1}{2}$ correctly written as an improper fraction M1 ( indep) for $\times \frac{8}{5}$ A1 for 20 oe

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4	(i) (ii) (iii)	16 cm <sup>2</sup> 8 cm <sup>2</sup> 16 cm <sup>2</sup>	4	B1 cao M1 for $\frac{4 \times 4}{2}$ or "16" $\div 2$ A1 ft for 8 or "(i)" $\div 2$ B1 ft for 16 or "(i)" or "(ii)" $\times 2$
5	(a)(i) (ii) (b)(i) (ii) (c) $15p + 10 - 10p + 6$	$a + 3b$ $2x^2 + x$ $8x - 12$ $pq - p^3$ $5p + 16$	2 2 1 1 2	B2 for $a + 3b$ oe (B1 for a or 1a or 3b) B2 for $2x^2 + x$ oe (B1 for $2x^2$ or $x$ or $1x$ ) B1 oe B1 oe accept $p \times q - p \times p^2$ or better B2 for $5p + 16$ oe (B1 for any two terms correct from $15p, +10, -10p, +6$ )
6	(i) Enlargement scale factor 2 centre (0,0) (ii)		3 2	B1 for enlargement B1 for scale factor 2 B1 for centre (0,0) B2 for all points correct B1 for any other correct reflection of <b>P</b>
7	(i) $360 - 138 = 222$ (ii) $360 - (180 - 63)$	222 243	2 1	M1 for $360 - 138 - 63$ or 159 seen or for $180 - 138$ or 42 seen A1 cao B1cao for 243
8	$360 \div 6$	$60^\circ$	2	M1 for $360 \div 6$ or $(180 - 720 \div 6)$ A1 for $60^\circ$ (SC B1 if M0 awarded for 120 seen)

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9	Different modes of transport Tally frequency		3	B1 for type of transport or list of at least 3 different types B1 for tally or tally marks B1 for frequency
10	$\frac{18\,000 \times 365}{3500}$ $\frac{20\,000 \times 400}{4000}$	2000	3	M1 for $\div 3500$ or $\div 4000$ or 5 seen M1 for $\times 365$ or $\times 400$ or $\times 7 \times 4 \times 12$ A1 for answer in range 1800 - 2300
11	Each student $4^\circ$	80 10 40 15 60	4	B1 for $80 (\pm 2^\circ)$ B1 for measuring $40^\circ$ and $60^\circ (\pm 2^\circ)$ B1ft for 10 B1 ft for 15 (SC B1 for $360 \div 90$ or $180 \div 45$ or 4 seen, if B0 awarded)
12	(a) $3p + q + 3p + q + p + q$	$7p + 3q$	2	M1 for $3p + q + 3p + q + p + q$ A1 for $7p + 3q$ (SC B1 for answer of $4p+2q$ )
	(b) $\frac{180 - x}{2}$ or $(180 - x) \div 2$	$\frac{180 - x}{2}$	2	M1 for $(180 - x)$ seen A1 for fully correct expression (accept $\frac{(180 - A)}{2}$ )
	(c) $3p + q = 11$ $p + q = 3$ Subtract $2p = 8$	$p = 4$ $q = -1$	3	M1 for intention to subtract M1 (dep) for substituting found value into either equation A1 for $p=4, q=-1$
13	(a)(i)	$4 \times 10^7$	2	B1 cao
	(ii)	0.000 03		B1 cao
	(b) $12 \times 10^2$ $1.2 \times 10^3$	$1.2 \times 10^3$	2	M1 for $12 \times 10^2$ or 1200 ft from "(a)" A1 for $1.2 \times 10^3$ ft

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14	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 $45^\circ \pm 2^\circ$ (SC(B1 after B0 awarded $45^\circ$ with no arcs and $90^\circ$ angle seen))
15	$\frac{1}{2} \times 4 \times 3 \times 7$	$42 \text{ cm}^3$	4	M1 for $\frac{1}{2} \times 4 \times 3$ or attempt at area of triangle (accept $4 \times 3$ ) M1 for "their area" $\times 7$ or where 7 is part of a triple product A1 for 42 cao B1 for $\text{cm}^3$
16	(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)

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17	(a) $20 \times 1.2 + -5 \times 1.2^2$ $24 - 7.2 =$	16.8	2	M1 for substituting correctly A1 cao
	(b) $50 = 5u + -5 \times 25$ $50 = 5u - 125$ $5u = 175$	35	2	M1 for $50 = 5u - 125$ oe A1 for 35
	(c) $D - kt^2 = ut$ $u = \frac{D - kt^2}{t}$	$\frac{D - kt^2}{T}$	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)
18	(a)	$25 < A \leq 35$	1	B1 cao
	(b)	44,100,134,1 53,160	1	B1 cao
	(c)		2	B1 ft for at least 4 of 5 points plotted correctly $\pm \frac{1}{2}$ 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)
	(d)(i) Median 30 – 32	30 to 32	3	B1 ft from their cf graph $\pm \frac{1}{2}$ sq
	(ii) IQR 40 – 24	15 to 18		M1 ft from their cf graph identifying “120” and “40” A1 ft $\pm 1$ sq
	(e)		2	B2 if fully correct B1 for box with median or quartiles or whiskers correct

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19	(a) Lines $x = 2$ and $y = x$ Line $x + y = 6$		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)
20	(a) $90 - 35 = 55^\circ$ Angle in a semi-circle = $90^\circ$	$55^\circ$	2	B1 for $55^\circ$ B1 for (angle in) a <b>semi-circle</b> = $90^\circ$
	(b) $90 - "55"$	$35^\circ$	1	B1 for $35^\circ$ ft
	(c) $180 - 2 \times 35$ $= 110^\circ$	$110^\circ$	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