| Paper 5525/06 | | | | | |
|---|---|---|---|---|---|
| No | | Working | Answer | Mark | Notes |
| 1 | (a) | $\frac{\sqrt{25.96}}{4.05} = \frac{5.09509...}{4.05}$ | 1.258048316 | 2 | M1 for 5.09… or 4.05 or 25.96 seen<br>A1 for at least 4 sf rounded or truncated: 1.258(048316…) or 1.26 |
| | (b) | | 1.26 | 1 | B1 for 1.26 or ft from (a); 1.260 gets B0 |
| 2 | (a) | | $p^9$ | 1 | B1cao |
| | (b) | | $q^5$ | 1 | B1cao |
| | (c) | | $t^{12}$ | 1 | B1cao |
| | (d) | $6m + 8 + 3m - 15$ | $9m - 7$ | 2 | M1 for correct expansion of at least one term<br>A1 for $9m - 7$ |
| 3 | | $168^2 + 157^2 = 28\,224 + 24\,649$<br>$= 52\,873$<br>$\sqrt{28224 + 24649}$ | 229.9 - 230 | 3 | M1 for $168^2 + 157^2$<br>M1 $\sqrt{168^2 + 157^2}$ or $\sqrt{28224 + 24649}$ or $\sqrt{52873}$ ie not doubling<br>A1 for 229.9-230 |
| 4 | | $\frac{8}{25} \times 1750$ or $0.32 \times 1750$ or $8 \times 70$ | 560 | 3 | M1 for $\frac{8}{25}$ oe seen or $\frac{1750}{25}$ oe seen or 0.32 or 70 seen<br>M1 for $\frac{8}{25} \times 1750$ oe<br>A1 for 560 |

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| 5 | (a) | 3.1 \| 68.2(31)<br>3.2 \| 73.7(28)<br>3.3 \| 79.4(97)<br>3.4 \| 85.5(44)<br>3.5 \| 91.8(75)<br>3.6 \| 98.4(96)<br>3.7 \| 105.4(13)<br>3.65 \| 101.9(1725) | 3.6 | 4 | B2 for trial $3.1 \le x \le 3.7$ evaluated<br>(B1 for trial $3 < x < 4$ evaluated)<br>B1 for different trial $3.615 \le x \le 3.65$ evaluated<br>B1 for 3.6, (dep on at least one of 2 previous Bs) or anything that rounds to 3.6<br>Values evaluated can be rounded or truncated, but to at least 1 d.p. |
| | (b)(i) | | $x^2(x+4)=100$ | 2 | B1 for $x^2(x+4)$ seen or $x \times x \times x + 4$<br>*OR*<br>"3.6"$^3$+4×"3.6"$^2$ ≈ 100 (dep on 3.6≤(a)≤3.7); (46.656+4×51.84)<br>B1 ft from "3.6" ie "3.6" + 4 |
| | (ii) | | 7.6 | | |
| 6 | (a) | $121.6(0) \times \frac{100}{4}$ | 3040 | 2 | M1 for $121.6(0) \times \frac{100}{4}$<br>A1 cao |
| | (b) | 1.04 oe seen<br>$2828.8 \div 1.04$ | 2720 | 3 | B1 for 1.04 oe seen<br>M1 for $2828.8 \div 1.04$ oe<br>A1 for 2720 |
| 7 | (a) | | 95 185 220 235 240 | 1 | B1 for all correct |
| | (b) | | Points | 2 | B1 ft for at least 4 or 5 pts plotted correctly (± 1 sq) at ends of interval dep on sensible table (cf; no more than 1 error) |
| | | | curve or line segment | | B1ft (dep on previous B1) for pts joined by curve/line segments provided no gradient is negative<br>(SC: B1 if 4 or 5 pts plotted not at ends but consistently within each interval **and** joined) |
| | (c) | | 20.5 - 22 | 1 | B1 ft from a cf graph using cf = 120 (.5) |

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| 8 | (a) | | perp bisector | 2 | B1 appropriate arcs<br>B1 if within guidelines |
| | (b) | | Angle bisector | 2 | B1 appropriate arcs<br>B1 if within guidelines |
| 9 | (a) | 12 600 or $1.26\times10^4$ | $1.12\times10^2$ | 2 | M1 for 12 600 or $1.26\times10^4$<br>A1 for $1.12\times10^2$ - $1.123\times10^2$ oe |
| | (b) | $d^2 = \frac{3h}{2}$ | $\frac{2d^2}{3}$ | 2 | M1 for squaring each side<br>A1 for $\frac{2d^2}{3}$ oe |
| 10 | | $\cos x = \frac{3.9}{4.7} = 0.8297\ldots$ | 33.9 | 3 | M1 for $\cos = \frac{3.9}{4.7}$ (= 0.8297…)<br>M1 (dep) for $\cos^{-1}$<br>A1 for 33.9 –33.93<br>SC B2 for 0.592(069…) or 37.6(923…) or 37.7 |
| 11 | | Region $x < 3$<br>Region $y > -2$<br>Region $y < x$ | **R** shaded | 4 | B4(dep on well defined border) correct region labelled **R**.<br>If not labelled, dep on all inequalities being clearly shaded<br>(B3 corrected region with incorrectly marked boundaries)<br>(B2 2 out of 3 correct regions, consistently shaded or all 3 lines drawn to form a triangle)<br>(B1 any one region correctly shaded either side or any two correct lines drawn) |

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| 12 | | $\left(\frac{1}{2}\times\pi\times30^2+60\times45\right)\times90$<br>(1/2 × 2827.43+2700)×90<br>(1413.7..+2700)×90<br>4113.7.. × 90 = 370234.5… | 370 000 | 5 | **Cross-section approach:**<br>M1 for $(\frac{1}{2}\times)\pi\times30^2$ (=2827.4 or 1413.7) or 60×45 (=2700)<br>M1 for "$(\frac{1}{2}\times)\pi\times30^2$" + 60 × 45 (complete method)<br>M1 for "*any* area" × 90 or 4110–4115<br>A1 for 370 000 to 370300<br>B1 correct units<br>**Volume approach:**<br>M1 for $(\frac{1}{2}\times)\pi\times30^2$ or 60×45<br>M1 for "$(\frac{1}{2}\times)\pi\times30^2$"×90 (=127234 or 254468) or 60 × 45 × 90 (=243000)<br>M1 for addition of two volumes<br>A1 for 370 000 to 370300 (370 235)<br>B1 correct units |
| 13 | (i)<br>(ii)<br>(iii) | | E<br>A<br>I | 3 | B1 for E cao<br>B1 for A cao<br>B1 for I cao |
| 14 | | 60 × 40 × 2<br>4800<br>"4800"= $\pi\times4^2\times h$<br>$\frac{\text{"4800"}}{\text{"50.265..."}}$ | 95.5 | 5 | M1 60 × 40 × 2<br>A1 for 4800<br>M1 for $\pi\times4^2$ or 50.265…<br>M1 for "4800" ÷ "π x $4^2$"<br>A1 95.49 - 95.5 |
| 15 | | $\frac{x}{450}\times70$<br>7, 18.8, 15.2, 28.9 | 7, 19, 15, 29 | 3 | M1 valid method<br>A2 all correct<br>(A1 2 or 3 correct)<br>SC unrounded: M1 A1 A0 |

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| 16 | (a) | $d = kt^2$<br><br>$20 = k \times 2^2$ | $d = 5t^2$ | 3 | M1 for $d = kt^2$ (accept any $k \neq 0, 1$)<br>M1(dep) for $20 = k \times 2^2$<br>A1 for $d = 5t^2$ |
| | (b) | | 45 | 1 | B1 for 45 cao |
| | (c) | $605 = 5t^2$<br><br>$\sqrt{\frac{605}{5}}$ | 11 | 3 | M1 for $605 = "5" t^2$ ("5" $\neq 1$)<br>M1 for $\sqrt{\frac{605}{"5"}}$<br>A1 for 11 cao |
| 17 | | eg $0.91^8 = 0.4702\ldots$ | 8 | 3 | B1 for 0.91 seen oe<br>M1 for $0.91^2$ (0.8281) or higher power evaluated<br>A1 for 8 – 8.01 |
| 18 | (a) | $2x + 2y = 10$ | | 1 | B1 for $2x + 2y = 10$ oe |
| | (b) | $x^2 + y^2 = 16$<br>$x^2 + (5 - x)^2 = 16$ | | 3 | B1 for $x^2 + y^2 = 4^2$ oe<br>M1 for rearranging first equation and substituting into second<br>A1 for sight of $25 - 10x + x^2$ and correct simplification to the given equation |
| | (c) | $x = \frac{10 \pm \sqrt{(-10)^2 - 4 \times 2 \times 9}}{2 \times 2}$<br>$\frac{10 \pm \sqrt{28}}{4}$ | 3.82; 1.18 | 3 | M1 for correct substitution into quadratic formula (allow sign errors)<br>A1 for correct simplification<br><br>A1 for 3.82 – 3.823, 1.177 – 1.18 |

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|---|---|---|---|---|---|
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| 19 | | $qx = p(x + c)$<br>$qx = px + pc$<br>$qx - px = pc$<br>$x(q - p) = pc$ | $\frac{pc}{q - p}$ | 4 | M1 for $qx = p(x + c)$ oe<br>M1 for $qx = px + pc$ oe<br>M1 for $x(q - p) = pc$ oe process<br>A1 for $\frac{pc}{q - p}$ oe |
| 20 | (a) | eg $\frac{4.2^2 + 5.3^2 - 7.6^2}{2 \times 4.2 \times 5.3}$<br>$\frac{-12.03}{44.52}$ or $-0.2702\ldots$ | 105.7 | 3 | M1 for correct substitution into cosine rule to find any angle<br>M1(dep) for correct order of evaluation of their cosine rule to get to $\cos X = \frac{p}{q}$ where $p$ and $q$ are numbers<br>A1 105.67 – 105.7 |
| | (b) | eg $\frac{1}{2} \times 4.2 \times 5.3 \times \sin$"105.67°" | 10.7 | 3 | M2 for substitution of lengths of 2 sides and their included angle into $\frac{1}{2}ab\sin C$<br>(M1 if it is their angle but not the included one)<br>A1 for 10.7 – 10.72 |
| 21 | (a)(i) | $\frac{4.75}{5.35}$ | 0.887850467 | 3 | B3 LB = 0.8878-0.888 and UB = 0.9238 - 0.924<br>(B2 one of LB or UB correct)<br>(B1 sight of one of 4.75, 5.35, 4.85, 5.25)<br>SC: B2 correct answers in wrong order |
| | (ii) | $\frac{4.85}{5.25}$ | 0.923809523 | | |
| | (b) | | 0.9<br>Bounds agree to 1 dp | 2 | B1 dep on two correct bounds for gradient<br>B1 dep on two correct bounds for gradient |

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|---|---|---|---|---|
| **No** | **Working** | **Answer** | **Mark** | **Notes** |
| 22 | 0.62 × 0.38 or 0.2356<br>× 2 oe | 0.4712 | 4 | B1 for 0.38 seen<br>M1 for 0.62 × (1-0.62) or 0.2356<br>M1(dep) for × 2 oe<br>A1 for 0.47, 0.471, 0.4712 oe |
| 23 | $\frac{49152}{12000}$ or 4.096<br><br>$\sqrt[3]{4.096}$ or 1.6<br>"1.6"$^2$ or 2.56 | 3800 | 4 | M1 for $\frac{49152}{12000}$ or 4.096 oe<br><br>M1 for $\sqrt[3]{4.096}$ or 1.6 oe<br>M1 for "1.6"$^2$ or 2.56 oe<br>A1 for 3800 cao |