


November 2009

| 1380/4H | | | | | |
|----------|---------|--|------|--|--|
| Question | Working | Answer | Mark | Notes | |
| 1 | | 43 25 (19) 87 (36) (42) 35 113 (79) 67 (54) (200) | 3 | B3 for all 6 correct (B2 for 4 or 5 correct) (B1 for 2 or 3 correct) | |
| 2 | (a) | 28.38461538 | 2 | B2 for 28.3846.... (B1 for 107.01 or 3.77 or 28.38(...) or $28\frac{5}{13}$ oe seen) | |
| | (b) | 30 | 1 | B1ft for 30 or for answer >1sf in (a) rounded to 1 sf | |
| 3 | (a) | $3 \times 2 + 5 \times -4$ | 2 | M1 for $3 \times 2 + 5 \times -4$ oe or 6 and -20 seen A1 cao for -14 | |
| | (b) | $3(m-2)$ | 1 | B1 cao | |
| 4 | | Reason | 1 | B1 for 'The first 2 pages may not be typical of the whole magazine' oe or 'sample size too small' oe | |
| 5 | (a) | Correct plane | 2 | B2 for a correct plane defined by showing at least 2 adjacent lines of the plane (B1 for a line of symmetry on one face) | |
| | (b) | Correct elevation  | 2 | B2 for a sketch of trapezium (B1 for trapezium with a rectangle or parallelogram added at top or a side or lines drawn from vertices) | |

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| 6 | (i) | | 45 | 1 | B1 cao |
| | (ii) | | | 1 | B1 (dep) for corresponding angles (accept F angles) or any other complete reason that includes properties of parallel lines e.g. alternate angles (accept Z angles) with 45 marked on diagram (or angles on a straight line = 180) or allied angles with 135 marked on diagram |
| 7 | | $\pi \times 5 \times 5$ | 78.5 | 2 | M1 for $\pi \times 5 \times 5$ (accept π as 3.1 or better) A1 for 77.5 to 78.6 or 25π |
| 8 | | $1.72 \div 2$ (= 0.86) $7.65 \div 9$ (= 0.85) | Large box with reasons | 3 | M1 for $1.72 \div 2$ (= 0.86) M1 for $7.65 \div 9$ (= 0.85) A1 for large box or 9 kg with correct calculations OR M1 for $2 \div 1.72$ (= 1.162...) M1 for $9 \div 7.65$ (= 1.176...) A1 for large box or 9 kg with correct calculations OR M2 for $7.65 \times 2 \div 9$ (=1.70) or for $1.72 \div 2 \times 9$ (=7.74) A1 for large box or 9 kg with correct calculations OR M1 for 1.72×9 (= 15.48) M1 for 7.65×2 (= 15.30) A1 for large box or 9 kg with correct calculations NOTE: Accept equivalent methods for comparison |

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| 9 | | Rotation 180° Centre (0, 1) | 3 | B1 for rotation B1 for 180 (or half turn) B1 for (0, 1) OR B1 for enlargement B1 for scale factor -1 B1 for (0, 1) (B0 for any combination of transformations) |
| 10 | $360 + \frac{17.5}{100} \times 360$ | 423 | 3 | M1 for $\frac{17.5}{100} \times 360$ oe or 10% + 5% + 2.5% oe (condone 1 calculation error) or 63 seen or 36, 18 and 9 seen M1 (dep) for 360 + '63' A1 for 423 OR M2 for 1.175×360 oe A1 for 423 |
| 11 | (a) | Negative | 1 | B1 cao |
| | (b) | 117 – 123 | 2 | M1 for a line of best fit drawn between (9, 130) & (9, 140) and between (13, 100) & (13,110) inc.. A1 for 117 – 123 inclusive |

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| 12 | (a) | $2x + 9 + 2x - 3 + 4x + 5$ | $8x + 11$ | 2 | M1 for attempting to add $2x + 9$, $2x - 3$ and $4x + 5$ or for $8x + c$, $c \neq 0$ A1 for $8x + 11$ |
| | (b) | $8x + 11 = 39$ $8x = 28$ | 3.5 | 2 | M1 for " $ax (+ c) = 39$ or $(39 - 'c') \div 'a'$ " A1f.t. for 3.5 oe provided ' $c' \neq 0$ in (a) |
| 13 | | $180 \div 9 (=20)$ 20×4 | 80 | 3 | M2 for $180 \div (2 + 3 + 4) \times 4$ or 40, 60, 80 seen (M1 for $180 \div (2 + 3 + 4)$ or 20 seen A1 cao |
| 14 | | $3 \rightarrow 33$ $4 \rightarrow 72$ $3.1 \rightarrow 35.9(91)$ $3.2 \rightarrow 39.1(68)$ $3.3 \rightarrow 42.5(37)$ $3.4 \rightarrow 46.1(04)$ $3.5 \rightarrow 49.8(75)$ $3.6 \rightarrow 53.8(56)$ $3.7 \rightarrow 58.0(53)$ $3.8 \rightarrow 62.4(72)$ $3.9 \rightarrow 67.1(19)$ $3.75 \rightarrow 60.2(34375)$ | 3.7 | 4 | B2 for a trial between 3.7 and 3.8 inclusive (B1 for a trial between 3 and 4 inclusive) B1 for a different trial between 3.7 and 3.8 exclusive B1 (dep on at least one previous B1) for 3.7 NB Trials should be evaluated to at least 1dp truncated or rounded |

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| 15 | (a) | m^7 | 1 | B1 for m^7 , (accept m^{3+4}) |
| | (b) | p^4 | 1 | B1 for p^4 , (accept p^{7-3}) |
| | (c) | $12x^3y^5$ | 2 | B2 cao (B1 for two of 12, x^3 , y^5 , ignore \times signs) |
| 16 | $14^2 + 12^2$ $= 196 + 144 = 340$ $\sqrt{340} = 18.4\dots$ | 18.4 | 3 | M1 for $14^2 + 12^2$ M1 (dep) for $\sqrt{14^2 + 12^2}$ A1 for 18.4 to 18.44 |
| 17 | (a) | 9, -3, 3 | 2 | B2 for all three correct (B1 one or two correct) |
| | (b) | | 2 | B1 ft for all 7 'points' plotted correctly ± 1 square B1 ft (indep) for a smooth curve through 6 or 7 of their plotted points provided at least B1 awarded in (a), with 6 or 7 points correctly plotted and (1, -3) & (2, -3) not joined with a straight line |
| 18 | (a) | $150 \leq h < 160$ | 1 | B1 for $150 \leq h < 160$ (accept 150 to 160) |
| | (b) | $(125 \times 8) + (135 \times 16) +$ $(145 \times 25) + (155 \times 30) +$ (165×21) $= 1000 + 2160 + 3625 +$ $4650 + 3465$ $= 14900$ $14900 \div 100$ | 4 | M1 for $f \times h$ for at least 3 consistent values of h in or at either end of intervals M1 (dep) for use of all correct mid-interval values (for 1 st interval accept 124.5 to 125) M1 (dep on 1 st M1) for $\sum fh \div \sum f$ A1 cao |

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| 19 | (a) | $x^2 - 3x + 5x - 15$ | $x^2 + 2x - 15$ | 2 | B2 for $x^2 + 2x - 15$ (B1 for $x^2 - 3x + 5x - 15$ with at least 3 terms correct or 4 terms correct ignoring signs) |
| | (b) | $\frac{29-x}{4} \times 4 = x \times 4 + 5 \times 4$ $29 - 20 = 4x + x$ $5x = 9$ | 1.8 | 3 | M1 for multiplying through by 4 or $\frac{29-x}{4} - \frac{x}{4} = x + 5$ M1 for correct rearrangement of their 4 terms to separate x and non- x terms A1 for 1.8 oe |
| 20 | (a) | $121 + 136 + 71 + 32 = 360$ $360 \div 4 = 90$ | 90 | 2 | M1 for $(121 + 136 + 71 + 32) \div 4$ or $360 \div 4$ A1 cao |
| | (b) | | increasing | 1 | B1 for increasing (cost of gas) oe |
| 21 | | $132.88 \div 88 \times 100$ | 151 | 3 | M1 for recognising that 88% is equivalent to 132.88 M1 for $132.88 \div 88 \times 100$ oe A1 cao |
| 22 | (a) | $6 \times \frac{15}{10}$ | 9 | 2 | M1 for sight of $\frac{15}{10}$ or $\frac{10}{15}$ or $\frac{10}{6}$ or $\frac{6}{10}$ oe seen A1 cao NB ratios get M0 unless of the form 1: n |
| | (b) | $12 \times \frac{10}{15}$ oe | 8 | 2 | M1 for correct use of $\frac{15}{10}$ or $\frac{10}{15}$ or $\frac{15}{12}$ or $\frac{12}{15}$ or $\frac{9}{6}$ or $\frac{6}{9}$ oe A1 for 8 or ft from $12 \times 6 \div '9'$ |

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| 23 | $\cos x = \frac{8.2}{10.6} = 0.77358\dots$ $x = \cos^{-1} \frac{8.2}{10.6} = 39.323\dots$ | 39.3 | 3 | M1 for $\cos x = \frac{8.2}{10.6}$ or $\cos \frac{8.2}{10.6}$ M1 for $\cos^{-1} \frac{8.2}{10.6}$ A1 for 39.3 – 39.33 SC: M2A0 for 0.686 or 43.69 or 39.2 or 39.37... or 39.4 | |
| 24 | $85 \div 382 \times 50$ | 11 | 2 | M1 for $85 \div 382 \times 50$ oe or 11.1(...) seen A1 cao | |
| 25 | (a) | $y = kx$ $10 = k \times 500$ | $y = \frac{1}{50}x$ | 3 | M2 for $10 = k \times 500$ oe or $10 = \frac{500}{k}$ oe (M1 for $y = kx$ or $y = \frac{x}{k}$ or $y \propto x$) A1 for $y = \frac{1}{50}x$ oe (eg $y = 0.02x$) |
| | (b) | | 7 | 1 | B1 ft from linear $y = kx$ |

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| 26 | (a) | $0.5 \times 5 \times 8 \times \sin 75$ | 19.3 | 2 | M1 for $0.5 \times 5 \times 8 \times \sin 75$ A1 for 19.3 – 19.32 SC M1A0 for 7.7(5..) or –7.7(5..) or 18.4(7..) seen |
| | (b) | $AB^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos 75$ $= 25 + 64 - 80 \times \cos 75 = 68.29\dots$ $AB = \sqrt{89 - 80 \times \cos 75}$ $= 8.264\dots$ | 8.26 | 3 | M1 for $AB^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \times \cos 75$ M1 (dep) for 89 – ‘80’ cos 75 A1 for 8.26 (4...) SC M1M1A0 for 3.9(0..) or 7.6(4..) seen |
| 27 | (a) | | 30 60 | 2 | B1 cao B1 cao |
| | (b) | | fd = 1.5 (ht 3cm) fd = 0.5 (ht 1cm) | 2 | M1 for at least one correct frequency density calculated for the last 2 bars (could be implied by one correct bar) or 1 sq = 5 cars A1 cao |
| 28 | | Upper bound $\sqrt{\frac{6.435}{5.5135}} = 1.080340$ Lower bound $\sqrt{\frac{6.425}{5.5145}} = 1.079402$ | 1.08 because the LB and UB agree to that number of figures | 5 | B1 for either 6.435 or 6.425 or 6.434999... B1 for either 5.5145 or 5.5135 or 5.5144999... M1 for ‘6.435’ ÷ ‘5.5135’ where $6.43 < '6.435' \leq 6.44$ and where $5.513 \leq '5.5135' < 5.514$ OR for ‘6.425’ ÷ ‘5.5145’ where $6.42 \leq '6.425' < 6.43$ and where $5.514 < '5.5145' \leq 5.515$ A1 for 1.0794(02...) and 1.0803(40...) A1 for 1.08 and ‘both LB and UB round to 1.08’ oe |

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| 29 | $4(2x - 1) + 3(x + 3)$ $= (x + 3)(2x - 1)$ $8x - 4 + 3x + 9$ $= 2x^2 - x + 6x - 3$ $2x^2 - 6x - 8 = 0$ $2(x - 4)(x + 1) = 0$ | $x = -1, 4$ | 5 | <p>M1 multiplying both sides by a common denominator of $(x + 3)(2x - 1)$ oe</p> <p>or $\frac{4(2x - 1) + 3(x + 3)}{(x + 3)(2x - 1)} (= 1)$ or better seen</p> <p>or multiplying all 3 terms by $(x + 3)$ or by $(2x - 1)$</p> <p>M1 (indep) for $2x^2 - x + 6x - 3$ oe seen</p> <p>or $8x - 4 + 3x + 9$ oe</p> <p>A1 for $2x^2 - 6x - 8$ oe or $x^2 - 3x - 4 (= 0)$</p> <p>M1 (dep on M2) for correct method to solve a 3 term quadratic</p> <p>A1 cao for both solutions</p> |