| **Paper 1MA1: 1H** |  |
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| **Question** | **Working** | **Answer** | **Notes** |
| 1 |  |  | 42 | P1 | process to start problem solving eg forms an appropriate equation |
|  |  |  |  | P1 | complete process to solve equation |
|  |  |  |  | A1 | cao |
| 2 |  |  | 4 m2 | B1 | substitution into formula eg  |
|  |  |  |  | A1 | 4 (oe) stated |
|  |  |  |  | C1 | (indep) units stated |
| 3 |  |  | 0.22 | P1 | begins process of subtraction of probabilities from 1 |
|  |  |  |  | A1 | oe |
| 4 |  |  | 48 | P1 | begins to work with rectangle dimensions eg *l*+*w*=7 or 2×*l*+*w* (=11) |
|  |  |  |  | C1 | shows a result for a dimension eg using *l*=4 or *w*=3 |
|  |  |  |  | P1 | begins process of finding total area eg 4 × “3” × “4” |
|  |  |  |  | A1 | cao |
| 5 |  |  | explanation | M1 | works with volume eg 240000 | begins working back eg 70÷2.50 |
|  |  |  |  | M1 | uses conversion 1 litre = 1000 cm3 | uses conversion 1 litre = 1000 cm3 |
|  |  |  |  | M1 | uses 8000 eg vol ÷ 8000 (=30) | uses 8000 eg “28”× 8000 (=224000) |
|  |  |  |  | M1 | uses “30” eg “30” × 2.50 | works with vol. eg 224000 |
|  |  |  |  | C1 | for explanation and 75 stated | for explanation with 240000 and 224000 |

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| **Question** | **Working** | **Answer** | **Notes** |
| 6 | (a) |  | Sharif | B1 | Sharif with mention of greatest total throws |
|  | (b) |  | No | P1 | starts working with proportions |
|  |  |  | (supported) | A1 | Conclusion: correct for Paul, but not for the rest; or ref to just Paul’s results |
|  | (c) | Tot: H 300  T 100 |  | P1 | selects Sharif or overall and multiplies P(heads)×P(heads) eg ¾ × ¾  |
|  |  |  |  | A1 | oe |
| 7 | (a) |  |  | B1 |  |
|  | (b) |  | 6 | M1 | starts process eg  |
|  |  |  |  | A1 | answer given |
| 8 | (a) |  | 5.7×1026 to | B1 | uses estimates eg 1.899 to 1.9 or 2 |
|  |  |  | 6×1026  | M1 | process of multiplication eg 0.57 × 1027 |
|  |  |  |  | A1 | between 5.7×1026 and 6×1026 |
|  | (b) |  | explanation | C1 | eg underestimate a number is rounded up |
| 9 |  |  | ‘Yes’ with correct  | P1 | begins process of working with mean eg 35×10 (=350) or 33×11 (=363) or 10×(35−33) (=20) or 11×(35−33) (=22) |
|  |  |  | working | P1 | (dep) finding the difference eg “363”−“350”, or 33 – “20” or 35 – “22” |
|  |  |  |  | C1 | ‘Yes’ with 13 from correct working |

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| **Question** | **Working** | **Answer** | **Notes** |
| 10 | (a) |  | 5 | P1 | begins to work with scaling factors (eg 5) or ÷6 |
|  |  |  |  | A1 | cao |
|  | (b) |  | 10 | P1 | works with 1:2 ratio eg no. red counters is 30÷2 (=15) |
|  |  |  |  | A1 | ft |
| 11 |  |  | 25 | B1 | cao |
| 12 |  |  | 37.5 mph | P1 | shows process of finding first distance eg 50 × 3 (=150) |
|  |  |  |  | P1 | shows process of finding time for second part eg 150 ÷ 30 (=5 h) |
|  |  |  |  | P1 | shows process of working with av sp. (dist ÷ time) (= 300÷(3+5) = 300÷8 ) |
|  |  |  |  | C1 | conclusion with supporting evidence, correct notation and units eg 37.5 mph |
| 13 |  |  |  | M1 | clear fractions or remove sq rt sign |
|  |  |  | or | M1 | (dep) clear fractions and remove sq rt sign |
|  |  |  | A1 | or  |
| 14 |  |  |  | M1 | multiplies all terms by 2 or 3 to reconcile fractions |
|  |  |  |  | M1 | complete process of expanding brackets and isolating *x* term |
|  |  |  |  | A1 | cao |
| 15 |  |  |  | M1 | factorising to give (2*x* − 5)(*x* + 1) |
|  |  |  |  | M1 | factorising to give (*x* + 5)(*x* + 1) |
|  |  |  |  | A1 | cao |
| 16 |  |  | D, A, B, C | B1 | for at least 2 correct |
|  |  |  |  | B1 | for all correct |
| 17 |  |  | SAS | M1 | links PQR and PRQ (eg isosceles triangle) with full reasons |
|  |  |  |  | M1 | links TR and SQ with full reasons |
|  |  |  |  | C1 | gives full conclusion for congruency eg SAS |
| 18 |  |  | 75*π* | P1 | starts process by using  and to find radius as 5 |
|  |  |  |  | P1 | starts process using ½ curved surface area eg (4 × *π* × 52 ) ÷ 2 |
|  |  |  |  | P1 | complete process shown eg (4 × *π* × 52 ) ÷ 2 + ( *π* × 52 ) |
|  |  |  |  | A1 | for 75*π*  |
| 19 |  |  | √31 | M1 | expands brackets eg 36 + 6√5 – 6√5 −√25 (=31) |
|  |  |  |  | M1 | rationalises the denominator eg using √31 with numerator & denominator |
|  |  |  |  | A1 | for √31 |

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| **Question** | **Working** | **Answer** | **Notes** |
| 20 |  |  | proof | M1 | for any two consecutive integers expressed algebraically eg *n* + 1 and *n*  | for sight of *p*2 – *q*2 = (*p* – *q*)(*p* + *q*) |
|  |  |  | (supported) | M1 | (dep) for the difference between the squares of “two consecutive integers” expressed algebraically eg (*n* + 1)2 − *n*2  | for deduction that *p* – *q* = 1 |
|  |  |  |  | A1 | for correct expansion and simplification of difference of squares eg 2*n* + 1 | for linking these two statements eg substitution of 1 for *p* − *q* |
|  |  |  |  | C1 | for showing statement is correct (with supportive evidence) eg *n* + *n* + 1 = 2*n* + 1 and (*n* + 1)2 − *n*2 = 2*n* + 1 | for fully stated proof and deduction eg *p*2 – *q*2 = 1 × (*p* + *q*) = *p* + *q* |
| 21 |  |  |  | P1 | for or  or  or  or  or  seen on diagram or in a calculation |
|  |  |  |  | P1 | for × or ×  | for ×+× |
|  |  |  |  | P1 | for × + × | for 1 – (×+×) |
|  |  |  |  | P1 | for beginning to process the algebra |
|  |  |  |  | A1 |  oe |

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| **Question** | **Working** | **Answer** | **Notes** |
| 22 |  |  |  | M1 | states *AB* as 6**b** – 3**a** |
|  |  |  |  | M1 | for *AX* = ⅓*AB* or ⅓“(6**b** – 3**a**)” or ft to 2**b – a**  |
|  |  |  |  | M1 | for =  +  = 6**b** + 5**a** – **b** (=5**b** + 5**a**) |
|  |  |  |  | M1 | for  = 3a + “2b – a” or  = 6b − ⅔“(6**b** – 3**a**)” (= 2**a** + 2**b**) |
|  |  |  |  | C1 | for (5**a** + 5**b**) = 2(**a** + **b**) =  |
| 23 |  |  |  | P1 | for a process to find the gradient of the line *AB* |
|  |  |  |  | P1 | (dep) for a process to find the gradient of a perpendicular line eg use of −1/*m* |
|  |  |  |  | P1 | (dep on P2) for substitution of *x*=5, *y*=−1 |
|  |  |  |  | A1 | equation stated oe |