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| **Solutions**  **Yearly Examination** | |
| **2013**  **Year 10**  **Mathematics Course** | |
| **Short Answer Questions** | |
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|  | Using Pythagoras Theorem. |
|  | Rectangular prism whose dimensions are 9cm × 3 cm × 2 cm. |
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|  |  |
|  |  |
|  | D is 6 units right and 1 unit down from *A*  D is |
|  |  |
|  | Probability of selecting a red marble is  so there are 6 red marbles and since there are 6 blue marbles this leaves 4 white marbles. |
|  | There are 20 divisions on the bar chart, so each is 5%.  Labour costs are 45%, so 9 divisions. |
|  | 9:15 to 12:15 is three hours.  12:15 to 4:25 is four hours and 10 min.  Total time is 7 hours and 10 minutes.  Cost = $40.00 |
|  | Scores 4, 5, 5, 6, 7, 8  Median =  Mode = 5  Mean =  Highest is the mean. |
|  | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  | O |  |  |  | |  |  | ~~O~~ | ~~O~~ | O |  | ~~O~~ | |  |  | ~~O~~ | ~~O~~ | ~~O~~ | ~~O~~ | ~~O~~ | |  | ~~O~~ | ~~O~~ | ~~O~~ | ~~O~~ | ~~O~~ | ~~O~~ | |  | 0 | 1 | 2 | 3 | 4 | 5 |     Median = 2.5  LQ = 1.5 UQ = 4  Interquartile range = 4 – 1.5 = 2.5 |

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| **Multiple Choice Questions** | | |
|  | A.  B.  C. 0.37 =37% D.  Largest is A | A |
|  |  | C |
|  |  | B |
|  |  | A |
|  |  | C |
|  | *CD* is at 90o to *C’D’* and the direction of labelling is the same, so it is a rotation through 90o. | B |
|  | Since two sides are equal it is isosceles and  . Using the angle sum  so it is obtuse. | C |
|  |  | D |
|  |  | D |
|  | Triangle *I* is congruent to triangle *III (SAS)*  Triangle *II* is congruent to triangle *IV* (SSS) | D |
|  |  | B |
|  |  | A |
|  |  | A |
|  |  | A |
|  |  | C |
|  | A.  B.  C.  D. | D |
|  | A Gradient =  B Gradient =  C Gradient =  D Gradient = | B |
|  |  | B |
|  |  | D |
|  | Is concave up | D |
|  |  | C |
|  | Only handed to each tenth student so it is a sample, and the answer is a name, so it is categorical data. | C |
|  | Of the pairs given, Newspapers and Magazines together are 25% which is the same as the internet.  Magazines and Radio are also the same, but are not an option. | A |
|  |  | A |
|  | The upper quartile is 7, so B is incorrect. | B |
|  | 12 hour shift = 8 hrs at normal plus four hrs at time ½  = 8 + 6 = 14 hours  Pay = | B |
|  | Deposit =  Repayments =  Extra paid = | A |
|  |  | C |
|  |  | D |
|  |  | D |
|  | Angle A is between 0 and 90  Angle B is between 90 and 180  Angle C is between 90 and 270  So it can be obtuse, straight or reflex, but not a revolution. | C |
|  |  | B |
|  | Triangle X and Triangle Z both have a two sides and an included angle respectively equal. (SAS) | A |
|  | In  and  there is a common angle A and two angles which are equal (corresponding angles on parallel lines), so they are equiangular, and hence similar. | D |
|  |  | B |
|  |  | A |
|  |  | C |
|  |  | C |
|  |  | B |
|  |  | B |
|  |  | A |
|  |  | D |
|  | Parabola is concave down, so of form  *y* intercept is 16, so equation is | D |
|  |  | C |
|  |  | A |
|  | The outcomes with at least 3 tails are underlined.  HHH, HHT, HTH, HTT, THT, THH, TTH, TTT | C |
|  |  | D |
|  |  | B |
|  | As the scores are in classes, we don’t know enough to exactly find the median, mode or range, but the frequency does give the exact number of players. | C |
|  | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Denise | | | | | Stem | Alistair | | | | | |  |  |  | 4 | 2 | 0 | 9 |  |  |  |  | |  |  | 4 | 3 | 0 | 1 | 5 | 8 |  |  |  | | 8 | 5 | 3 | 1 | 1 | 2 | 2 | 3 | 4 | 5 |  | |  |  | 5 | 3 | 2 | 3 | 3 | 5 | 5 | 5 | 8 | |  |  |  | 5 | 1 | 4 | 1 | 3 | 4 |  |  |   Lower Quartiles =13 and 22  Median = 23 and 33  Upper Quartile = 33 and 38  Interquartile ranges  Denise =33 – 13 = 20  Alistair = 38 – 22 = 16  IQR are 20 and 16. | A |

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| **Longer Answer Questions** | | |
| 76. (a) |  | 1 |
| (b) |  | 2 |
| 77. |  | 2 |
| 78. (a) |  | 1 |
| (b) |  | 1 |
| 79. (a) |  | 1 |
| (b) |  | 2 |
| 80. (a) | Total of 25 in the class. | 1 |
| (b) |  | 1 |
| (c) |  | 1 |
| 81. (a) | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Darke Street | | | | | Number of  accidents per week | Keene Avenue | | | | | |  |  |  |  | ~~●~~ | 0 | ~~●~~ | ~~●~~ |  |  |  | |  |  |  | ~~●~~ | ~~●~~ | 1 | ~~●~~ | ~~●~~ | ~~●~~ |  |  | |  |  | ~~●~~ | ~~●~~ | ~~●~~ | 2 | ~~●~~ | ● | ~~●~~ | ~~●~~ | ~~●~~ | |  | ~~●~~ | ~~●~~ | ~~●~~ | ● | 3 | ~~●~~ | ~~●~~ |  |  |  | |  |  | ~~●~~ | ~~●~~ | ~~●~~ | 4 | ~~●~~ |  |  |  |  |   Darke st median = 3 Keene Ave median = 2  Darke st is greater, with a value of 3 compared to 2. | 1 |
| (b) | Darke St Lower Q = 1.5 Upper Q =3.5 Interquartile = 2  Keene Ave Lower Q = 1 Upper Q =2.5 Interquartile = 1.5  Darke st is greater, with a value of 2 compared to 1.5. | 2 |
| 82. (a) |  | 1 |
| (b) | Show that M lies on | 1 |
| 83. (a) |  | 1 |
| (b) | A rotation through 180o about the midpoint of *RU*. | 1 |
| 84. (a) |  | 2 |
| (b) |  | 1 |
| 85. (a) | From the graph  (allow between 3.1 and 3.5) | 1 |
| (b) | As *L* increases, *W* decreases. | 1 |