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| **Western Mathematics**  **2013 Year 10**  **Half Yearly Examination**  **Advanced Mathematics Course**  **Solutions** | |
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| **Short Answer Questions** | |
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|  |  |
|  | Profit = 28 – 16 = $12.00  Profit as a percentage of the cost price =  = |
|  | Docos : Dramas = 16 : 44 = 4 : 11 |
|  | 0.6 tonnes = 600 kg  Time = |
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|  |  |
|  |  |
|  | Perimeter = |
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|  |  |
|  | Point is on since    The point *P* is (4, 3) |
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|  |  |
|  | Norah’s angle is 72o, which corresponds to 1 440 votes, so each degree corresponds to 20 votes.  Jess’ angle was 108o, which means she got |
|  |  |
|  | Mean = |
|  | From 34 scores the median is the 17th and 18th scores which are 4 and 5, so the median is 4.5.  From the lower 17 scores the median is the 9th score which is a 3.  From the upper 17 scores the median is the 17+9 = 26thscore which is a 5.  Interquartile range = 5 – 3 = **2.** |

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| **Multiple Choice Questions** | | |
|  | A  B  C  D. | D |
|  | Rate =  Term = | B |
|  | Rate =  Term = | A |
|  |  | D |
|  | 5 : 3 : 1 = S : 9 : C (multiplication by 3)  = 15 : 9 : 3  Sand = 15 and Cement = 3 | C |
|  |  | C |
|  |  | A |
|  | Some sides are parallel, but they are not necessarily so, | A |
|  | 4th angle in left hand quadrilateral  (Corresponding angles on || lines) | C |
|  |  | A |
|  |  | B |
|  |  | C |
|  |  | D |
|  |  | C |
|  |  | D |
|  | = | A |
|  |  | D |
|  |  | C |
|  |  | B |
|  | Line 1 should be | A |
|  | From 14:00 to 16:30 so 2  hours. | D |
|  | The scores are clustered toward the lower end so it is skewed. | B |
|  | Mean =  Median = 10th and 11th scores;  ie the average of 32 and 34 which is 33.  Mode is 43 (occurs twice) | B |
|  | Interquartile range = 42 – 25 = 17 | D |
|  | Bridgetown data is symmetrical about 13. | A |
|  |  | D |
|  | Value = | D |
|  |  | D |
|  |  | B |
|  |  | B |
|  |  | A |
|  |  | B |
|  |  | C |
|  |  | C |
|  | SA = | A |
|  |  | D |
|  |  | C |
|  |  | B |
|  | Mistake is in line 2 where it should be | B |
|  | From graph solution is (2, 6). | C |
|  |  | D |
|  |  | A |
|  | Section B has slowest speed, so would be the steepest | B |
|  | Between 8 and 9 has the steepest gradient, so is the greatest rate (direction is not important). | D |
|  | The graph would be a reflection in the x axis, so would pass through (0, -1) | B |
|  | P( PS and G) = | A |
|  | P( under 20 and failed) = | A |
|  | Green is fairly symmetrical, Brown is skewed.  Brown median is 38 and Green Median is 25  Brown data is more skewed and has the higher median | A |
|  | The Brown data has a mean of 34.8 and a SD of 11.4  The Green data has a mean of 24.7 and a SD of 11.1  Similar SD but Brown mean is much higher. | D |
|  | 24 is lower quartile and 36 is the upper extremity, so 75% lie between these. | B |

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| Longer Answer Questions | | |
| 76 |  | 1 mark |
|  | b) | 2  1 mark for expansion by correct conjugate  1 mark for simplifying |
|  | a) | 1 mark |
| 77 | b) | 2 mark  1 for volume of sphere  1 for solving equation for radius |
| 78 |  |  |
|  | a) | 1 marks  1 for answer |
|  | b) | 2 marks  1 for angle  1 for bearing |
| 79 | a) From table, value of $1 000 = $716.89  Value of $20 000 = | 1 marks |
|  | b) Value of $1000  From table under 6%, time is 6 years. | 2 marks  1 for value  1 for time |
| 80 | a) | 1 mark |
|  | b) | 2 marks  1 mark for factoring  1 mark for simplifying (okay if top left as |
| 81 | a) | 2 marks  1 mark for factoring  1 mark for solution |
|  | b) | 2 marks  1 mark for substitution into formula  1 for solution  (not necessary to simplify) |
| 82 |  | 2 marks  1 mark for correct intercepts  1 for correct shape |
|  | b) Either by sketching or | 1 mark |
| 83 | |  |  |  |  | | --- | --- | --- | --- | | Class | Class Centre (*x*) | Frequency (*f*) | *fx* | | 1 – 3 | 2 | 2 | 4 | | 4 – 6 | 5 | 5 | 25 | | 7 – 9 | 8 | 8 | 64 | | 10 – 12 | 11 | 4 | 44 | | 13 – 15 | 14 | 5 | 70 | | 16 – 18 | 17 | 6 | 102 |   30 309 | 1 mark |
|  | b) Mean = | 1 mark |
|  | c) Draw a cumulative frequency polygon and draw a horizontal line from the middle value on the vertical axis until it meets the cf polygon and follow it down to read off an estimate for the median. | 1 mark |