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| **Western Mathematics**  **2014 Year 10**  **Yearly Examination**  **Mathematics Course**  **Solutions** |

| **2014 Yearly Advanced Mathematics Exam**  **Short Answer Questions**  **Answers** | |
| --- | --- |
|  | The temperatures in increasing order are :    -15o C, -6o C, -2o C, 0o C and 3o C |
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|  | ***NB Different printers will produce small differences in the sizes of the diagram. Check your own printed copy by measuring, before marking student responses.*** |
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|  |  |
|  | Or by using the distance formula |
|  |  |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | 42 | 15 | 27 | 34 | 62 | | 72 | 48 | 18 | 33 | 55 | | 37 | 52 | 15 | 32 | 17 | | 57 | 44 | 38 | 19 | 22 | |
|  |  |
|  | |  |  |  |  | | --- | --- | --- | --- | | 0 | 2 |  |  | | 1 | 1 | 2 |  | | 2 | 2 | X |  | | 3 | 0 | 2 | 3 | | 4 | 2 | 3 |  | | 5 | 0 |  |  |   Sum of scores given = 2+11+12+22+30+32+33+42+43+50 = 277  Missing score = 301 – 277 = 24  The X represents 4 to make 24. |
|  | Length of whole graph = 12 cm and of winner (Lorna) = 4 cm.  Votes for Lorna = |
|  |  |
|  | Arrange in order first.  11.0, 11.1, 11.2, 11.4, 11.4, 11.6, 11.9, 12.0, 12.1, 12.5  Lower Q Median = 11.5 Upper Q  Interquartile range = 12.0 – 11.2 = 0.8 |

| **2014 Yearly Advanced Mathematics Exam**  **Multiple Choice Section**  **Answers** | | |
| --- | --- | --- |
|  |  | **C** |
|  |  | **B** |
|  |  | **B** |
|  | Value has halved when it reaches $20 000.    From Graph this is after 3 years. | **D** |
|  |  | **D** |
|  |  | **A** |
|  |  | **D** |
|  |  | **A** |
|  |  | **C** |
|  |  | **C** |
|  |  | **D** |
|  |  | **C** |
|  |  | **B** |
|  |  | **C** |
|  |  | **B** |
|  |  | **D** |
|  | has a gradient of  and a y intercept of -3.  A. | **A** |
|  | Noah’s average speed on his return journey =  So statement A is incorrect. The oters are all correct. | **A** |
|  | The others are all euqual to | **B** |
|  | A and B both include equality signs so do not match the graph  C has solution with inequality in opposite direction.    D has correct solution | **D** |
|  |  | **A** |
|  | The others will not always have a probability of | **A** |
|  | |  |  |  | | --- | --- | --- | | Class Centre | Frequency | fx | | 3 | 6 | 18 | | 8 | 15 | 120 | | 13 | 35 | 455 | | 18 | 40 | 720 | | 23 | 37 | 851 | | 28 | 14 | 392 | |  | 147 | 2556 |     Or by entering data in scientific calculator. | **B** |
|  | 1. The median is calculated using all the prices and the mean is not.   Both are found using all the prices.   1. The median gives a better indication of the spread of the data.   The median gives no indication of the spread.   1. The median is less effected by outliers than the mode.   Neither are affected by outliers.   1. The median is less effected by outliers than the mean.   The mean can be effected by a few very large (or small) prices. | **D** |
|  | Both B and C indicate linear relationships, and C has a positive gradient. | **C** |
|  | 16.5% p.a. interest =  Interest =  Amount repaid = $4.33 + $456 = $460.33 | **A** |
|  |  | **A** |
|  |  | **C** |
|  | OR  OR | **B** |
|  | The angle sum of a polygon  The angle sum of a dodecagon  Interior angle of a regular dodecagon | **D** |
|  |  | **A** |
|  |  | **C** |
|  |  | **B** |
|  |  | **C** |
|  |  | **D** |
|  | The gradient of the line through A(-3, 2) and B(5, -2)  Equation of line : | **B** |
|  |  | **D** |
|  |  | **A** |
|  | Substitute  into | **D** |
|  | Sketch    The points are (-3, 0) and (3, -12) | **C** |
|  |  | **B** |
|  |  | **D** |
|  |  | **B** |
|  |  | **B** |
|  | Given the point (2, 10) lies on the graph and the shape is a hyperbola. | **A** |
|  | |  |  |  |  | | --- | --- | --- | --- | |  | Male | Female | Total | | Bulldogs | 26 | 14 | 40 | | Tigers | 32 | 28 | 60 | | Total | 58 | 42 | 100 |   Probability that a female chosen supports Tigers = | **C** |
|  | Number of recipes with both flour and sugar = 6 + 12 = 18  Total number of recipes = 6+12+9+7+6+2+7+11 = 60  Probability recipe has flour and sugar = | **C** |
|  | From Scientific Calculator | **A** |
|  | The scores in a negative skew have a cluster in the higher values and a longer tail toward the lower values, which is illustrated in this box plot. | **B** |
|  | 1. Both brands have an average amount of fibre which is 15 grams or more.   Means (averages) are 15.1 and 15.0 which are both 15 or more.   1. Brand A would have the middle 50% of its packets within a 3.6 gram range   The interquartile range for Brand A is 3.6 which means the above.   1. Brand B would have 25% of its packets with more than 15.7 grams of fibre.   Since Brand B is symmetrical and has IQR of 1.6, 0.8 of middle 50% would be above median. = 14.9 + 0.8 = 15.7 so 25% are above this,   1. Brand B is less consistent in achieving amounts of fibre which are close to their claim.   Brand B has the smaller standard deviation and IQR, so it has more values nearer the mean and median, so it is better at being close to its claim. | **D** |

| **2014 Yearly Advanced Mathematics Exam**  **Longer Answer Section**  **Answers** | | |
| --- | --- | --- |
| 76. | (a) | 1 mark for correct answer. |
|  | (b) | 2 marks for correct answer.  1 mark if multiplication by conjugate is done with a minor error. |
| 77. |  | 2 marks for correct answer.  1 mark if an error made in the ratios, but calculations made correctly.  1 mark if an error made in the calculations, but ratios are written correctly. |
| 78. |  | 2 marks for correct answer.  1 mark if an error made in the formula, but calculations made correctly.  1 mark if an error made in the calculations, but substitution in formula done correctly. |
| 79. |  | 2 marks for correct answer  1 mark for answer which has a minor error in expansion or simplification |
| 80. |  |  |
|  | (a) | 2 marks for correct proof with well set out reasoning.  1 mark for attempted proof with an error in the reasoning. |
|  | (b)  OR | 1 mark for correct proof with well set out reasoning. |
| 81. |  |  |
|  | (a) | 1 mark for correct answer |
|  | (b) | 1 mark for correct answer |
| 82. |  | 2 marks for correct answer.  1 mark if an error made in using the formula, but remainder done correctly.  1 mark if an error made in a calculation, but remainder done correctly.  1 mark if angle found correctly, but bearing not calculated correctly. |
| 83. | (a) | 1 mark for both values |
|  | (b) Least value of y on axis, midway between intercepts at x = -1 | 1 mark |
|  | (c) | 1 mark for sketch showing intercepts and correct concavity and turning point |
| 84. | (a)   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **1** | **2** | **3** | **4** | **5** | **6** |  |  | | **1** | 1, 1 | 1, 2 | 1, 3 | 1, 4 | 1, 5 | 1, 6 |  |  | | **2** | 2, 1 | 2, 2 | 2, 3 | 2, 4 | 2, 5 | 2, 6 |  |  | | **3** | 3, 1 | 3, 2 | 3, 3 | 3, 4 | 3, 5 | 3, 6 |  | | | **4** | 4, 1 | 4, 2 | 4, 3 | 4, 4 | 4, 5 | 4, 6 |  |  | | **5** | 5, 1 | 5, 2 | 5, 3 | 5, 4 | 5, 5 | 5, 6 | Product 12 | | | **6** | 6, 1 | 6, 2 | 6, 3 | 6, 4 | 6, 5 | 6, 6 |  |  | | 1 mark if table completed correctly |
|  | (b) | 1 mark for answer |
| 85. | (a) From Scientific calculator ; | 1 mark for each |
|  | (b) The data is positively skewed with an outlier at 27 | 1 mark if skew and outlier is mentioned |

High School

2014 Yearly Exam

Advanced Mathematics Course

Multiple Choice Section Answer Sheet

Name \_\_\_\_MARKING SHEET Teacher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

26. A B C D

27. A B C D

28. A B C D

29. A B C D

30. A B C D

31. A B C D

32. A B C D

33. A B C D

34. A B C D

35. A B C D

36. A B C D

37. A B C D

38. A B C D

39. A B C D

40. A B C D

41. A B C D

42. A B C D

43. A B C D

44. A B C D

45. A B C D

46. A B C D

47. A B C D

48. A B C D

49. A B C D

50. A B C D

51. A B C D

52. A B C D

53. A B C D

54. A B C D

55. A B C D

56. A B C D

57. A B C D

58. A B C D

59. A B C D

60. A B C D

61. A B C D

62. A B C D

63. A B C D

64. A B C D

65. A B C D

66. A B C D

67. A B C D

68. A B C D

69. A B C D

70. A B C D

71. A B C D

72. A B C D

73. A B C D

74. A B C D

75. A B C D