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| High School | | |
| Half Yearly Examination  Mathematics | | |
| Year 10 2012 | | |
| Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | Teacher : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **General Instructions**   * Reading time: 5 minutes * Working time: 1 ½ hours * There will be a short break between Section 1 and Section 2 * Write using black or blue pen * You may use a pencil to draw or complete diagrams * Attempt ALL questions * Calculators may be used in Section 2. * Write your Name and Teacher’s Name in the spaces provided, | **Total Marks – 75**  **Section 1**  Non Calculator Section  **25 marks**  Time allowed for this section is 30 minutes  **Section 2**  **50 marks**  Time allowed for this section is 60 minutes  *Section 2 is in two parts*  Multiple Choice Section – 35 marks  Longer Answer Section – 15 marks | |
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| **Section 1**  Non Calculator Section | |
|  | Write all working and answers in the spaces provided on this test paper. |
| 1. | ......................................................................................................................................................... |
| 2. | Simplify the ratio 2.5 kg : 1500 g.    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 3. | What number lies halfway between    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 4. | Simplify    .......................................................................................................................................................... |
| 5. | The areas planted to various crops in the Mannering district are shown on the sector graph.  There were 56 100 hectares planted to crops in total.  What area was planted to cotton?    ...........................................................................    ........................................................................... |
| 6. | Andy pays a deposit of $65 when buying a computer priced at $1300. What percentage of the price is the deposit?    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 7. | The plot shows the number of runs scored by a batter in her last 20 games.     |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Stem | Leaves | | | | | | | | | 0 | ~~8~~ | ~~9~~ |  |  |  |  |  |  | | 1 | ~~0~~ | ~~4~~ | ~~5~~ | ~~7~~ |  |  |  |  | | 2 | ~~3~~ | ~~5~~ | ~~7~~ | 8 | 9 | ~~9~~ |  |  | | 3 | ~~0~~ | ~~2~~ | ~~4~~ | ~~4~~ | ~~8~~ |  |  |  | | 4 | ~~2~~ | ~~6~~ | ~~9~~ |  |  |  |  |  |       What was the median of her scores?  .......................................................................................................................................................... |
| 8. | A right triangle is shown below. Between what two integers does the value of *x* lie?    .......................................................................  ......................................................................  ......................................................................  ...................................................................... |
| 9. | Round 2.284 59 correct to 3 decimal places.    ......................................................................................................................................................... |
| 10. | Find the area of the rhombus.  .........................................................................    .........................................................................    .........................................................................  ......................................................................... |
| 11. | A bag contains four red, seven blue, three yellow and six white marbles. One marble is selected at random. What is the probability that it is not white?    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 12. | The distance to the star X124 is 12 300 000 000 000 000 000 km.  Express this in scientific notation.    .......................................................................................................................................................... |
| 13. | Expand and simplify    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 14. | The fuel gauge on a truck is shown.  The trucks fuel tank holds 320 litres.  The driver never allows the fuel tank to get less than  full.    How many litres can she use before refilling the tank?  ..........................................................................................................................................................    .......................................................................................................................................................... |
| 15. | Find the volume of the triangular prism shown.    .............................................................................    .............................................................................  .............................................................................    ............................................................................. |
| 16. | What is the size of  ......................................................................    .....................................................................    .....................................................................  ..................................................................... |
| 17. | Using π = 3.14, find the volume of the cylinder.      .............................................................................    .............................................................................  .............................................................................    ............................................................................. |
| 18. | What is the value of ?  .............................................................................    .............................................................................    ............................................................................. |
| 19. | Solve the equation:      ..........................................................................................................................................................    .......................................................................................................................................................... |
| 20. | Find the distance between the points  *C*(2, 2) and *D*(10, 8).  .....................................................................      .....................................................................    .....................................................................  ...................................................................... |
| 21. | The prism shown has a rhombus as its cross section.  Find the surface area of the prism.    .............................................................................    .............................................................................  .............................................................................    ............................................................................. |
| 22. | Factorise    ......................................................................................................................................................... |
| 23. | Sketch the image of the polygon *EFGH* after a reflection in the line *KL*. |
| 24. | Sketch the solution to    ..........................................................................................................................................................    .......................................................................................................................................................... |
| 25. | The graph shows the number of children living in each dwelling in a housing division.     |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  | O |  |  |  | |  |  |  | O |  |  |  | |  |  |  | O | O |  | O | |  |  | O | O | O | O | O | |  | O | O | O | O | O | O | |  | 0 | 1 | 2 | 3 | 4 | 5 |   Number of Children in Dwelling  What is the mean number of children in each dwelling?    .......................................................................................................................................................... |

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| **Section 2**  Multiple Choice Section | |
|  | Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section. |
| 1. | Which of the points, A, B, C or D has coordinates (-3, 4)?  A |
| 2. | Ahn counts his books and finds that of his books are novels, are car manuals, are biographies and the rest are lifestyle books. What fraction are lifestyle books.  B  A. B. C. D. |
| 3. | The Weather Bureau predicts a 30% chance of rain tomorrow. Which fraction represents the probability that it won’t rain?  D  A.  B.  C.  D. |
| 4. | Which of the following is not equal to  ?  C  A.  B. 0.85 C. 34% D. |
| 5. | If  calculate the value of to the nearest degree  C  A. 1o B. 27o C. 63o D. 70o |
| 6. | The graph shows the results of a survey on how young people communicated.  B  What percentage of those surveyed chose social media.  A. 25% B. 30% C. 35% D. 40% |
| 7. | When *x* is multiplied by 0.5, the result will be:  B  A. 2*x* B. C. *x* D. *x*2 |
| 8. | Christian's normal hourly rate of pay is $20.35 for a 35 hour week. He is paid time and a half for all overtime above 35 hours. What would he be paid for a 41 hour week?  B  A. $834.35 B. $895.40 C. $956.45 D. $1 251.53 |
| 9. | Which line in this solution of an equation; contains an error.    C   1. Line 1 B. Line 2 C. Line 3 D. Line 4 |
| 10. | 6.45 × 10-3 =  B  A. 0.000 645 B. 0.006 45 C. 645 D. 6 450 |
| 11. | A rate of $1.20 per metre is the same as :  B  A. 0.12 cents per centimetre B. 1.2 cents per centimetre  C. 12 cents per centimetre D. 24 cents per centimetre |
| 12. | What is the exact value of *x*?  A.  B.  C.  C  D. |
| 13. | D  A. 9*x6y6* B. 9*x5y5* C. 18*x6y6* D. 18*x5y5* |
| 14. | In the quadrilateral ABCD, .  What is the size of  A. 83o  B. 97o  C. 166o  A  D. 194o |
| 15. | The points *P* (-3, 3) and *Q* (1, -5) lie on a line l.  The equation of the line l, is:  A.  B.  C.  D.  D |
| 16. | Gauss High School is a coeducational school from years 7 - 12.  Which of the following would produce an unbiased random sample of students to complete a survey?  C  A. Survey the tenth person in each of the girls PE rolls at Gauss High School.  B. Survey every student who attends Gauss High School.  C. Survey the tenth boy and tenth girl in every class during period 1 at Gauss High School.  D. Survey every student in year 9 at Gauss High School. |
| 17. | Peta is paid a regular salary of $325.00 per week plus a commission of 3.6% of all her sales. What would she earn in a week where her sales were $12 000.00?  D  A. $368.20 B. $431.38 C. $432.00 D. $757.00 |
|  | **Questions 18 and 19 refer to the following.**  The back to back histogram compares the marks of the classes taught by Mr Bernoulli and Ms Euler. |
| 18. | Which is **not** true?  A. Ms Euler’s class results were skewed.  B. Mr Bernoulli’s class results were symmetric.  D  C. Mr Bernoulli’s class results were bi-modal.  D. Ms Euler’s class results were bi-modal. |
| 19. | Which class would have the median equal to the mean?  A  A. Mr Bernoulli’s B. Ms Euler’s C. Both classes D. Neither |
| 20. | Damien invested $16 000 at 9% pa simple interest for a period of time and earned $8640 in interest. For how long was the money invested?  D  A. 3 years B. 4 years C. 5 years D. 6 years |
| 21. | The shaded area in square metres is given by:    A. 4π  B. 16π  C. 48π  C  D. 144π |
| 22. | David and Annabelle play a game where a normal six sided die is rolled. David wins if an even number is rolled. Annabelle wins if a number greater than 3 is rolled.  B  What is the probability that on a single roll, it is a draw (i.e. that both win)?  A.  B.  C.  D. |
| 23. | Which is the best value for money when buying the same brand of soft drink?  A. 325 mL can for $1.30  B. 375 mL bottle for $1.80  C  C. 600 mL bottle for $2.10  D. 1.25 L bottle for $4.50 |
|  | **Questions 24 – 25 refer to the frequency distribution table below.** |
| 24. | What is the median of the scores?  B  A. 5 B. 5.5 C. 6 D. 7 |
| 25. | What is the mean of the scores (correct to one decimal place)?  D  A. 5.2 B. 5.4 C. 5.5 D. 5.6 |
| 26. | Find the value of *d* correct to one decimal place  A   1. 4.7 2. 17.4   C. 67.2  D. 18.6 |
| 27. | The Venn diagram at right shows the subject likes of 30 students in the class 9S.  A student is chosen at random from the 9S students.  What is the probability that the student likes History?  D  A.  B.  C.  D. |
| 28. | The area of the trapezium could be found using the calculation:  A.  B.  C.  D  D. |
| 29. | Triangle A is rotated through an angle of 90o clockwise. Which triangle could be the image?  A. Triangle W.  B. Triangle X.  C. Triangle Y.  C  D. Triangle Z. |
| 30. | Heather records the marks of twenty five students in the stem and leaf plot.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Stem | Leaves | | | | | | | | | 3 | 2 | 3 | 6 |  |  |  |  |  | | 4 | 1 | 3 | 3 | 3 | 3 | 8 |  |  | | 5 | 1 | 2 | 5 | 5 | 5 | 7 | 8 |  | | 6 | 0 | 4 | 5 | 7 | 8 | 9 |  |  | | 7 | 2 | 6 | 9 |  |  |  |  |  |   She realises that she has left out a score of 43.  A  Which will change when she includes the extra score?  A. the mean. B. the median. C. the mode. D. the range. |
|  | **Questions 31 – 32 refer to the following.**  The line graph shows how the population of a village has changed over a period of years. |
| 31. | What was the highest population?  C  A. 1 210 B. 1 225 C. 1 250 D. 1 300 |
| 32. | Between which years was the population above 1 100?  B  A. 1979 and 2000 B. 1979 and 1990  C. 1985 and 2000 D. 1985 and 1990 |
| 33. | A globe of the earth is to be made with a thin plastic shell. The radius of the globe is to be 25 cm, How many cm2 of plastic will be used for the globe?  A. 7 854  B. 31 416  C. 65 450  B  D. 523 599 |
| 34. | Which of the following is not a factorised form of  B  A.  B.  C.  D. |
| 35. | Martin is *m* years old. Joe is 6 years younger than Martin.  A  Which of these is an expression for Joe’s age in 5 years’ time?   1. *m* - 1 B. 5(*m* - 6) C. *m* + 1 D. 5*m* - 6 |

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| **Section 2**  Longer Answer Section | | |  | |
| Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper.  Calculators are allowed for this section. | | | |
| 1. | 2 marks | Solve the equation:      ………………………………………….  ………………………………………….  ………………………………………….  …………………………………………. | | |
| 2. | Carla bought a second hand car valued at $16 000 on terms. She paid a 25% deposit and then was charged 6% pa simple interest on the balance which she paid off in monthly payments over 4 years. | | | |
|  | a)  1 mark | What was the balance that Carla had to pay off after the deposit?    ..........................................................................................................................................................    .......................................................................................................................................................... | | |
| b)  1 mark | How much simple interest was she charged on the balance?    ..........................................................................................................................................................    .......................................................................................................................................................... | | |
| (c)  1 marks | How much would she pay each month to pay off the balance and the interest?    ..........................................................................................................................................................    .......................................................................................................................................................... | | |

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| 3. | A hiker walks 500 m from the base of a vertical cliff along level ground and then measures the angle of elevation of the top of the cliff to be 21o. He then walks a further 500 m in the same direction and again measures the angle of elevation. | |
|  | (a)  1 mark | Mark the information above on the diagram. |
| (b)  1 mark | Calculate the height of the cliff.    ……………………………………………………………………………………………  …………………………………………………………………………………………… |
| (c)  2 marks | What is the angle of elevation that he measures from the second position?    ……………………………………………………………………………………………  …………………………………………………………………………………………… |
| 4. | 2  marks | Find the value of *x* in the diagram below, outlining your reasons in a step by step manner.    …………………………………………  …………………………………………  …………………………………………  ………………………………………… |

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| 5. | a)  1  mark | The grouped frequency distribution gives the hours spent on completing a class project.  Complete the table.     |  |  |  |  | | --- | --- | --- | --- | | Class | Class Centre *x* | Frequency *f* | Cumulative *f* | | 1 – 6 | 3.5 | 4 | 4 | | 7 – 12 | 9.5 | 6 | 10 | | 13 – 18 | 15.5 | 8 | 18 | | 19 – 24 | 21.5 | 2 | 20 | |  |  |  |  | |
|  | 2  marks | Draw the cumulative frequency polygon (ogive) for the data. |
|  | 1  mark | Estimate the median using the ogive.    .................................................................................................................................................... |

High School

Half Yearly Exam

Mathematics

Multiple Choice Section

Answer Sheet

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D

16. A B C D

17. A B C D

18. A B C D

19. A B C D

20. A B C D

21. A B C D

22. A B C D

23. A B C D

24. A B C D

25. A B C D

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