

Province of the

**EASTERN CAPE**

EDUCATION

**SENIOR PHASE**

**GRADE 9**

**JUNE 2010**

|  |
| --- |
| **MATHEMATICS** |

**MARKS: 100**

**TIME: 2 hours**

|  |
| --- |
| This question paper consists of 13 pages. |

|  |  |  |
| --- | --- | --- |
| **INSTRUCTIONS AND INFORMATION** | |  |
|  | |  |
| 1. | Answer all the questions. |  |
|  |  |  |
| 2. | Write neatly and legibly. |  |
|  |  |  |
| 3. | Do not change the numbering of the questions. |  |
|  |  |  |
| 4. | Show all your calculations, where necessary. |  |
|  |  |  |
| 5. | A non- programmable calculator may be used. |  |

|  |  |  |
| --- | --- | --- |
| **SECTION A** | |  |
|  |  |  |
| **In this section, write only the correct LETTER next to the corresponding question number:** | |  |
|  |  |  |
| 1. | 3x3y2(6x2y) = … |  |
|  |  |  |
| A. | 18x6y3 |  |
| B. | 9x5y |  |
| C. | 18x6y2 |  |
| D. | 18x5y3 | (1) |
|  |  |  |
| 2. | Which of the following statements is INCORRECT? |  |
|  |  |  |
| A. | is an irrational number |  |
| B. |  |  |
| C. | 52 = 10 |  |
| D. | is a rational number | (1) |
|  |  |  |
| 3. | a2 – 25 = |  |
|  |  |  |
| A. | (a+25)(a+1) |  |
| B. | (a-5)(a+5) |  |
| C. | (5-a)(5+a) |  |
| D. | 5a(a-5) | (1) |
|  |  |  |
| 4. | Study the table below and choose the correct value of and |  |
|  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 1 | 2 | 3 | 4 | … | 12 | | -4 | 1 | 6 |  | … |  | |  |
|  |  |  |
| A. |  |  |
| B. |  |  |
| C. |  |  |
| D. |  | (2) |
|  |  |  |
| 5. | 72008 has the last digit as … |  |
|  |  |  |
| A. | 1. |  |
| B. | 3. |  |
| C. | 7. |  |
| D. | 9. | (2) |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| 6. | The South African flag may be displayed horizontally or vertically as shown below: |  |
|  |  |  |
|  | **A**  **B** |  |
|  |  |  |
|  | The type of transformation shown above is: |  |
|  |  |  |
| A. | Rotation through |  |
| B. | Translation |  |
| C. | Reflection |  |
| D. | Rotation through | (1) |
|  |  |  |
| 7. | Study the flow diagram below and determine the value of . |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| A. |  |  |
| B. |  |  |
| C. |  |  |
| D. |  | (1) |
|  |  |  |
| 8. | Solve for if |  |
|  |  |  |
| A. |  |  |
| B. |  |  |
| C. |  |  |
| D. |  | (1) |
|  |  |  |
| 9. | The square below is made up of four equal rectangles and a smaller square. |  |
|  |  |  |
|  |  |  |
|  | If the length and width of each rectangle is 6 units and 2 units respectively, then the area of the inner square is: |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| A. | 16 |  |
| B | 64 |  |
| C. | 48 |  |
| D. | 320 | (2) |
|  |  |  |
| 10. | Write  in scientific notation. |  |
|  |  |  |
| A. | 8,0 x 10-5 |  |
| B. | 8,0 x 10-4 |  |
| C. | 8,0 x 105 |  |
| D. | 8,0 x 104 | (1) |
|  |  |  |
| 11. | Which of the following statements is NOT a condition for congruency in triangles? |  |
|  |  |  |
| A. | side; side; side |  |
| B. | side; angle; side |  |
| C. | ; hypotenuse; side |  |
| D. | angle; angle; angle | (1) |
|  |  |  |
| 12. | Refer to the table below which shows the ages of various learners in Grade 9A at Progress High School. What is the mode and range of the ages respectively? |  |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Learner Name | Gert | Rajesh | Jane | Nomusa | Julius | Karabo | Siyasanga | | Age | 14 | 16 | 18 | 16 | 18 | 16 | 14 | |  |
|  |  |  |
| A. | Mode = 16 and Range = 4 |  |
| B. | Mode = 16 and Range = 14 |  |
| C. | Mode = 4 and Range = 16 |  |
| D. | Mode =16 and Range = 18 | (2) |
|  |  |  |
| 13. | Name the 3-dimensional container below. |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| A. | Pentagonal prism |  |
| B. | Hexagonal pyramid |  |
| C. | Hexagonal prism |  |
| D. | Cuboid | (1) |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | |  |
| 14. | What is the value of side ? The two triangles below are SIMILAR TRIANGLES. | |  |
|  |  | |  |
|  | 5 cm  x  4,8 cm  9,6 cm | |  |
| A. |  | |  |
| B. |  | |  |
| C. |  | |  |
| D. |  | | (2) |
|  |  | |  |
| 15. | is … | |  |
|  |  | |  |
| A. | real and rational. | |  |
| B. | real and irrational. | |  |
| C. | non-real. | |  |
| D. | a positive integer. | | (1) |
|  |  | |  |
| 16. | What number is represented by A on the ruler? | |  |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **A** | |  |  |  |  |  |  |  |  | |  | **↓** | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  | **3,12** | |  |  |  | **3,13** | |  |  | | | | |
|  |  | |  |
| A. | 3,11 | |  |
| B. | 3,1 | |  |
| C. | 3,118 | |  |
| D. | 3,18 | | (1) |
|  |  | |  |
| 17. | A pentagonal pyramid has … | |  |
|  |  | |  |
| A. | 4 faces. | |  |
| B. | 5 faces. | |  |
| C. | 6 faces. | |  |
| D. | 7 faces. | | (1) |
|  |  | |  |
| 18. | The next term in the sequence: 2; 8;18; 32; ... is: | |  |
|  |  | |  |
| A. | 42 | |  |
| B. | 64 | |  |
| C. | 72 | |  |
| D. | 50 | | (2) |
|  |  | |  |
|  |  | |  |
| 19. | Which of the following triangles are congruent? (The triangles are not drawn to scale) | |  |
|  | E  D    F  G  J  L    H  I  K | |  |
|  |  | |  |
|  |  | |  |
|  | A  B  C | |  |
|  |  | | (2) |
|  |  | | **[26]** |
|  |  | |  |
|  | **TOTAL SECTION A:** | | **26** |
|  |  | |  |
| **SECTION B** | | |  |
|  |  | |  |
| **QUESTION 1** | | |  |
|  |  | |  |
| 1.1 | Simplify the following expressions: | |  |
|  |  | |  |
|  | 2.1.1 |  | (2) |
|  |  |  |  |
|  | 2.1.2 |  | (4) |
|  |  |  |  |
| 1.2 | Factorise the following expression completely: | |  |
|  |  |  |  |
|  |  | | (3) |
|  |  | |  |
| 1.3 | Evaluate 1112-992 | | (2) |
|  |  | |  |
| 1.4 | Solve for : | |  |
|  |  | |  |
|  | 1.4.1 |  | (3) |
|  |  |  |  |
|  | 1.4.2 |  | (3) |
|  |  |  | **[17]** |

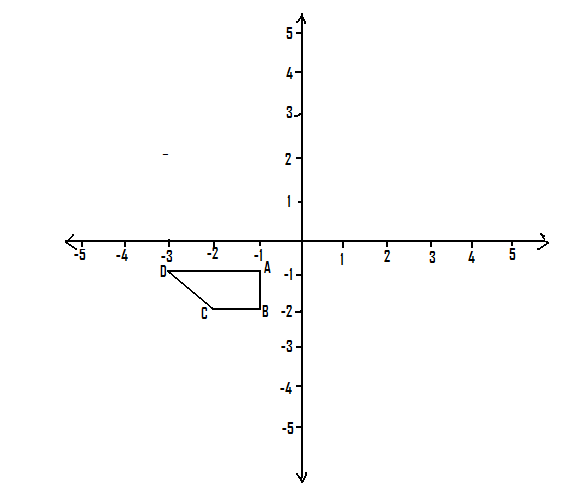
|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **QUESTION 2** | | |  |
|  |  |  |  |
| 2.1 | Study the pattern below and find the following: | |  |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Number | 1 | 2 | 3 | 4 | 5 | 200 | n | | Pattern | 4 | 11 | 18 | 25 |  |  |  | | |  |
|  |  |  |  |
|  | 2.1.1 | the 5th pattern | (1) |
|  |  |  |  |
|  | 2.1.2 | the general rule for this pattern | (3) |
|  |  |  |  |
|  | 2.1.3 | the 200th pattern | (1) |
|  |  |  |  |
| 2.2 | Study the graphs below and answer the questions that follow: | |  |
|  |  | |  |
|  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  | E |  |  |  | A |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | **3** |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | **1** |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  | F |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  | B |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  | D |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | |  |
|  |  | |  |
|  | 2.2.1 | The line graph with equation: passes through the points A and B in the sketch above. What is the value of ? |  |
|  |  |  | (1) |
|  | 2.2.2 | If the line passing through D is parallel to line AB, determine its equation. |  |
|  |  |  | (2) |
|  | 2.2.3 | Determine the co-ordinates of the -intercept of the line passing through D. |  |
|  |  |  | (3) |
|  | 2.2.4 | What is the equation of line EF? |  |
|  |  |  | (2) |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **QUESTION 3** | | |  |
|  |  |  |  |
| 3.1 | Study the following table and answer the questions that follow: | |  |
|  |  |  |  |
| |  |  |  |  | | --- | --- | --- | --- | | Name of Two-dimensional shape | Number of sides | Number of triangles | Sum of the interior angles | | Triangle | 3 | 1 |  | | Quadrilateral | 4 | 2 |  | | Pentagon | 5 | 3 |  | | Hexagon | 6 |  |  | | Any polygon | n |  |  | | | | |
|  |  |  |  |
|  | 3.1.1 | Use the pattern in the table above to find a value for the sum of the interior angles of a hexagon | (1) |
|  |  |  |  |
|  | 3.1.2 | Find a general formula for the sum of the interior angles of any n-sided polygon | (3) |
|  |  |  |  |
|  | 3.1.3 | Name the polygon which has the sum of the interior angles equal to . | (2) |
|  |  |  |  |
| 3.2 | Study the figure below and answer the questions that follow using the grid provided: | |  |
|  |  | |  |
|  |  |  |  |
|  | 3.2.1 | Translate the shape ABCD according to the formula: (*x*; *y*) |→ (*x* +4; *y* + 2) and draw its image on the grid paper provided. | (2) |
|  |  |  |  |
|  | 3.2.2 | Now reflect the image about the x-axis and write down the coordinates of the vertices of the reflected image. | (3) |
|  |  |  | **[11]** |
|  |  |  |  |
| **QUESTION 4** | | |  |
|  |  |  |  |
| 4.1 | A train 1 km long is travelling at a constant speed of 20 km/hour. It enters the tunnel which is 1 km long at 1:00 p.m. At what time does the rear of the train emerge from the tunnel? | | (4) |
|  |  |  |  |
| 4.2 | A reservoir is full. If 135 litres of water is added, the reservoir is full. What is the capacity (in litres) of the reservoir when full? | | (4) |
|  |  |  |  |
| 4.3 | A cylindrical tin can with baby powder milk has a radius of 8 cm and a height of 20 cm. Calculate the volume of powder milk in the can if there is a gap of 3 cm to the lid, as shown in the picture. Assume . (Give the answer correct to 2 decimal places). | |  |
|  |  | | (4) |
|  |  |  | **[12]** |
| **QUESTION 5** | | |  |
|  |  |  |  |
| 5.1 | Study the pie-chart below which shows the most popular subjects of 120 Grade 9 learners at Tafula High School. If 72º in the chart represents students who prefer History and 126º those who love English, then answer the questions that follow: | |  |
|  |  |  |  |
|  |  |  |  |
|  | 5.1.1 | What fraction of the pie chart represents History students? | (1) |
|  |  |  |  |
|  | 5.1.2 | How many students prefer English? | (2) |
|  |  |  |  |
|  | 5.1.3 | What percentage of the learners prefer Mathematics? | (3) |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 5.3 | The temperature, in °C, for each day of the week is represented in the bar graph below: | |  |
|  | **Day of the week**  **Temperature in °C** |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  | Using the temperatures given in the graph above determine the following (correct to 2 decimal places): | |  |
|  |  |  |  |
|  | 5.2.1 | median | (2) |
|  |  |  |  |
|  | 5.2.2 | range | (1) |
|  |  |  |  |
|  | 5.2.3 | mean | (3) |
|  |  |  |  |
| 5.2 | Draw a stem-and-leaf diagram to represent the data. | | (2) |
|  |  |  |  |
| 5.3 | Fourteen learners at Mzantsi High School obtained the following results in Mathematics and Language: | |  |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Mathematics | 10 | 40 | 60 | 70 | 58 | 24 | 75 | 44 | 33 | 28 | 66 | 71 | 14 | 33 | | Language | 30 | 50 | 55 | 81 | 48 | 36 | 62 | 29 | 54 | 14 | 55 | 62 | 22 | 46 | | | | |
|  |  |  |  |
|  | 5.3.1 | Draw a scatter diagram to illustrate the results. (Use the grid supplied) | (5) |
|  |  |  |  |
|  | 5.3.2 | What is the correlation between the marks obtained in Mathematics and Language? Explain your answer. | (2) |
|  |  |  | **[21]** |
|  |  |  |  |
|  | **TOTAL SECTION B:** | | **74** |
|  |  |  |  |
|  | **GRAND TOTAL:** | | **100** |
|  |  |  |  |

**DIAGRAM SHEET**

**QUESTION 3**

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**QUESTION 5**