

Province of the

**EASTERN CAPE**

EDUCATION

**SENIOR PHASE**

**GRADE 9**

**NOVEMBER 2010**

|  |
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| **MATHEMATICS** |

**MARKS: 100**

**TIME: 2 hours**

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| This question paper consists of 11 pages. |

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| **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, correct your answer to TWO decimal places where necessary. |  |
|  |  |  |
| 5. | A non-programmable calculator may be used. |  |

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| **QUESTION 1** | |  |
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| **In this question, write only the correct LETTER next to the corresponding question number:**  **EXAMPLE:**  1.11 The value of a in the equation 5a – 7 = 53 is  A. 5  B. 10  C. 13  D. 12  Since the correct answer is **12** simply write **D** for this question, for e.g. **1.11 D** | |  |
|  |  |  |
| 1.1 | The HI virus is 0,000 000 018 m in diameter. Expressed in scientific notation, it is … |  |
|  |  |  |
| A. | 1,8x10-8 m. |  |
| B. | 18x109 m. |  |
| C. | 1,8x109 m. |  |
| D. | 1,8x10-9 m. | (1) |
|  |  |  |
| 1.2 | (x4y5 z-2)3 simplified is … |  |
|  |  |  |
| A. | x7y5 z-5 |  |
| B. | x4y5 z-6 |  |
| C. | x7y8z-5 |  |
| D. | x12y15 z-6 | (1) |
|  |  |  |
| 1.3 |  |  |
|  |  |  |
| A. | 50 |  |
| B. | 17,8 |  |
| C. | 40 |  |
| D. |  | (1) |
|  |  |  |
| 1.4 | (2x-3)(x+4) = … |  |
|  |  |  |
| A. | 2*x*2+5*x*-12 |  |
| B. | 2*x*2-5*x*+12 |  |
| C. | 2*x*2-3*x*+12 |  |
| D. | 2*x*2-3*x*+12 | (1) |

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|  |  | | |  |
| 1.5 | The transformation that took place from A to B is: | | |  |
|  |  | | |  |
|  | A B |  | | |
|  |  | | |  |
| A. | Rotation through 90° | | |  |
| B. | Translation | | |  |
| C. | Reflection | | |  |
| D. | Rotation through 180° | | | (1) |
|  |  | | |  |
| 1.6 | The top view (view from the top) of the object below is: | | |  |
|  |  | | |  |
|  |  | |  | |
|  |  | | |  |
| A. |  | | |  |
| B. |  | | |  |
| C. |  | | |  |
| D. |  | | | (1) |
|  |  | | |  |
| 1.7 | The measure of each angle in a regular octagon is … | | |  |
|  |  | | |  |
| A. | 60°. | | |  |
| B. | 135°. | | |  |
| C. | 72°. | | |  |
| D. | 105°. | | | (1) |

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| 1.8 | In a bag containing marbles there are 7 blue, 5 red and 8 yellow marbles. What is the probability of picking a red marble? | | | |  |
|  |  | | | |  |
| A. |  | | | |  |
| B. |  | | | |  |
| C. |  | | | |  |
| D. |  | | | | (1) |
|  |  | | | |  |
| 1.9 | = … | | | |  |
|  |  | | | |  |
| A. |  | | | |  |
| B |  | | | |  |
| C. |  | | | |  |
| D. |  | | | | (1) |
|  |  | | | |  |
| 1.10 | | The general rule for the pattern 3; 8, 13, 18; 23 is … | | |  |
|  |  | | | |  |
| A. | 2n+1 | | | |  |
| B. | 5n-2 | | | |  |
| C. | 4n-1 | | | |  |
| D. | 7n-4 | | | | (1) |
|  |  | | | | **[10]** |
| **QUESTION 2** | | | | |  |
|  |  | | | |  |
| 2.1 | Samantha is interested in buying a new flat screen television set. At Betty’s Bargains the television is priced at a whopping R12 999 and it is on sale at the moment with a discount of 15%. At Serious Sisters Specials the same television is on display for R14 999 with a discount of 30%. | | | http://www.freewebs.com/sonypsfree/Sony%20flat%20screen%20tv.jpg |  |
|  |  | | |  |  |
|  | 2.1.1 | | Prepare two different calculations for each scenario that you can use to advise Samantha on where to purchase her new TV cheaper. | | (3) |
|  |  | |  | |  |
|  | 2.1.2 | | How much would this television cost her in dollars if $1= R7.35? | | (1) |
|  |  | |  | |  |
| 2.2 | Samantha as a manager earns R42 480 per month. She splits her earnings in the ratio 7:5 and then saves the lesser amount. | | | |  |
|  |  | | | |  |
|  | 2.2.1 | | How much does she save? | | (2) |
|  |  | |  | |  |
|  | 2.2.2 | | She decides to invest the amount in QUESTION 2.2.1 for 2 years at 6,5% compound interest per annum. Calculate the amount she gets at the end of this investment. | | (3) |
|  |  | |  | |  |
| 2.3 | Find TWO numbers whose sum is 20 and the sum of their squares is 208. | | | | (3) |
|  |  | |  | | **[12]** |

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| **QUESTION 3** | | |  |
|  |  |  |  |
| 3.1 | Solve for *x* in the equations given below: | |  |
|  |  |  |  |
|  | 3.1.1 |  | (3) |
|  |  |  |  |
|  | 3.1.2 | ( | (3) |
|  |  |  |  |
|  | 3.1.3 |  | (3) |
|  |  |  |  |
| 3.2 | Simplify the following expressions: | |  |
|  |  |  |  |
|  | 3.2.1 |  | (3) |
|  |  |  |  |
|  | 3.2.2 |  | (3) |
|  |  |  |  |
| 3.3 | Factorise the expression below: | |  |
|  |  | |  |
|  |  | | (2) |
|  |  |  | **[17]** |
| **QUESTION 4** | | |  |
|  |  |  |  |
| 4.1 | 4.1.1 | Extend the following number pattern by adding the next two terms:  2; 5; 10; 17; 26; …; … | (2) |
|  |  |  |  |
|  | 4.1.2 | Find the general rule. | (2) |
|  |  |  |  |
|  | 4.1.3 | Find the twentieth term. | (1) |
|  |  |  |  |
| 4.2 |  | |  |
|  | 4.2.1 | Write down the equation of the graph above. | (4) |

|  |  |  |  |  |  |
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| 4.3 | 4.3.1 | The two sheets of paper are similar in shape. Find the value of *h*. | |  | (2) |
|  |  |  | | | **[11]** |
| **QUESTION 5** | | | | |  |
|  |  |  | | |  |
| 5.1 | The area of a rectangle with breadth of 4*x* cm is given as . | |  | |  |
|  |  |  | | |  |
|  | 5.1.1 | What is the length of the rectangle? | | | (4) |
|  |  |  | | |  |
|  | 5.1.2 | Hence calculate the perimeter of this rectangle. | | | (2) |
|  |  | B  D  E  F  C  A  65°  52° | | |  |
| 5.2 |  | | | |  |
|  |  |  | | |  |
|  | 5.2.1 | In the figure above DB = CF and AB//CF, prove that ΔDBE ≡ ΔCFE | | | (4) |
|  |  |  | | |  |
|  | 5.2.2 | If ∠DBE = 52° and ∠DEB = 65° calculate the value of ∠CFE. | | | (3) |
|  |  |  | | |  |
| 5.3 | If AB//CD | | | |  |
|  |  |  | | |  |
|  | L  B  A  C  D  K  x+35°  3x-15°  P | | | |  |
|  |  |  | | |  |
|  | 5.3.1 | Find the value of *x.* | | | (4) |
|  |  |  | | |  |
|  | 5.3.2 | Hence find the value of ∠KPC. | | | (2) |
|  |  |  | | | **[19]** |

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| **QUESTION 6** | | | | |  |
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| 6.1 | Two airplanes take off at the same time from two airports 1 869 km apart. Plane B flies at 120 km/h faster than Plane A. Each of the planes are flying to the airport from which the other plane is taking off. | | http://www.dlr.de/en/Portaldata/1/Resources/portal_news/newsarchiv2006/a320/dlr_a320_oe-loe_2400.jpg | |  |
|  |  |  | | |  |
|  | 6.1.1 | Find an equation for distance in terms of the time (*t*) and the speed (*s*) of each of the planes. | | | (3) |
|  |  |  | | |  |
|  | 6.1.2 | Write the time in terms of the speed. | | | (3) |
|  |  |  | | |  |
| 6.2 | The sketch below shows the diagram of a house from the front view. The foot of the ladder is *x* m from the wall, and the length of the ladder is  *x* + 2 m. | | |  |  |
|  |  |  | | |  |
|  | 6.2.1 | If the height of the wall is 4 m, find *x.* | | | (3) |
|  |  |  | | |  |
|  | 6.2.2 | Hence find the length of the ladder (in meters). | | | (1) |
|  |  |  | | |  |
| 6.3 | Consider the figure below and answer the questions that follow:  (Use attached ANNEXURE A) | | | |  |
|  |  | | | |  |
|  | | | | | |
|  |  |  | | |  |
|  | 6.3.1 | Reflect object ABC along the x-axis. | | | (1) |
|  |  |  | | |  |
|  | 6.3.2 | Write down the coordinates of the image. | | | (1) |
|  |  |  | | |  |
|  | 6.3.3 | Join AA*l* and CC*l*. Name the quadrilateral formed by ABB*l*A*l* and give reasons for your answer. | | | (2) |
|  |  |  | | | **[14]** |

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| **QUESTION 7** | | | | |  |
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| The cumulative rainfall measured in a random selection of towns in Kwazulu-Natal for August 2009 is as follows: (information from [www.weathersa.co.za](http://www.weathersa.co.za)) | | | | |  |
|  |  | |  | |  |
|  | **KWAZULU-NATAL** | | **Total Rainfall (mm)** |  | |
|  | Babanango | | 13 |  | |
|  | Cathedral Peak-Hotel | | 3 |  | |
|  | Durban Weather Office | | 13 |  | |
|  | Giants Castle Aws | | 1 |  | |
|  | Greytown | | 11 |  | |
|  | Mandini | | 9 |  | |
|  | Paddock | | 6 |  | |
|  | Pennington South | | 35 |  | |
|  | Port Edward | | 57 |  | |
|  | Richards Bay Airport | | 13 |  | |
|  | Shaleburn | | 6 |  | |
|  |  | | | |  |
|  | 7.1.1 | Calculate the mean of the rainfall of the data above. | | | (2) |
|  |  |  | | |  |
|  | 7.1.2 | Determine the median of the data given. | | | (1) |
|  |  |  | | |  |
|  | 7.1.3 | What is the mode of the data? | | | (1) |
|  |  |  | | |  |
|  | 7.1.4 | Calculate the range of the data. | | | (1) |
|  |  |  | | |  |
|  | 7.1.5 | Represent the data in a stem and leaf diagram. | | | (2) |
|  |  |  | | |  |
| 7.2 | Suzanne and Boitumelo are playing a game. Suzanne has six buttons in a box. All the buttons have the same shape and size. There are 2 red buttons, 1 blue button and 3 purple buttons. Boitumelo flips a fair coin. | | | |  |
|  |  |  | | |  |
|  | 7.2.1 | Draw a probability tree diagram that shows all the probabilities for picking a button and flipping a coin. Suzanne replaced the button into the box after every draw. | | | (3) |
|  |  |  | | |  |
|  | 7.2.2 | What is the probability of drawing a blue button and flipping a head? | | | (2) |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 7.3 | This pie graph shows what a bran breakfast cereal is made of. | |  |
|  |  | |  |
|  | **BREAKFAST CEREALS** | |  |
|  | Fat | |  |
|  | **93°**  Fibre  **184°**  Carbohydrates  **10%**  **35°**  Protein  Others | |  |
|  |  | |  |
|  | The mass of an average serving of this cereal is 45 grams. | |  |
|  |  | |  |
|  | 7.3.1 | Calculate the angle at the centre for the sector representing fat. | (2) |
|  |  |  |  |
|  | 7.3.2 | What fraction of the circle represents the amount of fibre in the cereal? | (1) |
|  |  |  |  |
|  | 7.3.3 | What is the mass of protein in this serving of cereal? | (2) |
|  |  |  | **[17]** |
|  |  |  |  |
|  |  | **TOTAL:** | **100** |

**ANNEXURE A**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Gr: \_\_\_\_**

**QUESTION 6.3**

