HILLCREST HIGH SCHOOL

Grade 8 Mathematics Exam
Paper 1
November 2016

MARKS: 175 **TIME: 2 hours**

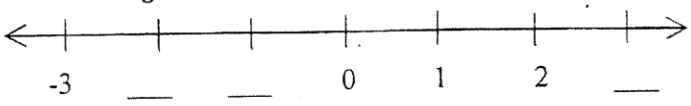
NAME :											CLASS:			
TEACHER:											DATE:			
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	TOTAL	%
25	3	4	3	13	12	11	39	15	8	12	18	12	175	

INSTRUCTIONS

1. **This question paper consists of 13 questions. Answer ALL the questions.**
2. **You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.**
3. **Show ALL calculations clearly.**
4. **Round off ALL final answers to TWO decimal places, unless stated otherwise.**
5. **Indicate units of measurement, where applicable.**
6. **Maps and diagrams are NOT necessarily drawn to scale, unless otherwise stated.**
7. **Write neatly and legibly.**

QUESTION 1

1.1 Fill in the missing numbers on the number line:



(3)

1.2. Consider the list of numbers: $-5\ ;\ -4\ ;\ 0\ ;\ 1\ ;\ 2\ ;\ 8\ ;\ 16\ ;\ 19\ ;\ 24\ ;\ 27$

From the given list write down: (Numbers may be used more than once)

1.2.1 The integers which are less than zero. _____ **(2)**

1.2.2 The positive odd numbers _____ **(2)**

1.2.3 The prime numbers _____ **(2)**

1.2.4 The positive factors of 24 _____ **(2)**

1.2.5 The positive multiples of 2 _____ **(2)**

1.2.6 The perfect square(s) _____ **(2)**

1.2.7 The perfect cube(s) _____ **(2)**

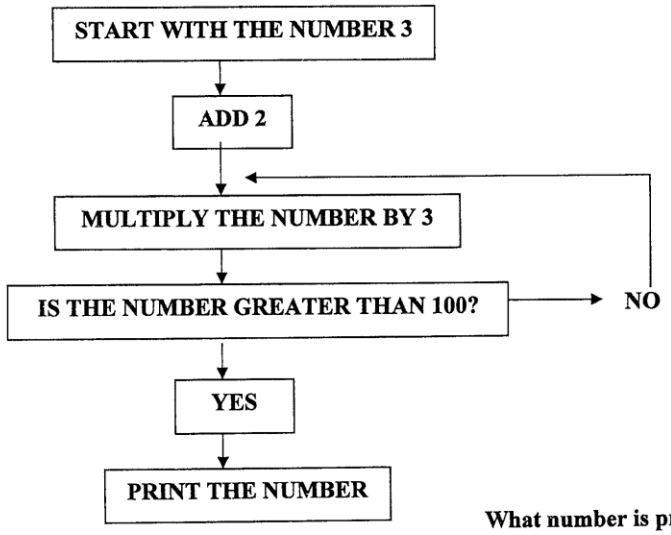
1.3 Complete each of the following:

1.3.1 $11+\square=11$ **1.3.2** $11-\square=9$ **1.3.3** $11-\square=13$

1.3.4 $11\times\square+11=44$ **1.3.5** $11\times 0=\square$ **1.3.6** $11\div 0=\square$

(6)

1.4 Follow the instructions in the flow diagram:



What number is printed out? _____ **(2)**

[25]

QUESTION 2

2.1 Input → [+2] → [×3] → [÷4] → Output

The above is a number machine. A number (called the input) is fed into the machine and another number (called the output) is then obtained.

2.1.1 If the input number is 10, what is the output number? _____ **(1)**

2.1.2 If the output number is 28, what is the input number? _____ **(1)**

2.2 Given: input → [square input number] → [−10] → output

2.1.1 If the input number is 5, what is the output number? _____ **(1)**

[3]

QUESTION 3

Calculate each of the following. Show ALL working.

3.1 $\sqrt[3]{64} + \sqrt{25} =$ _____ **(2)**

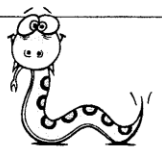
3.2 $(\sqrt{49})^2 - \sqrt[3]{1000} =$ _____ **(2)**

[4]

QUESTION 4

By using the product of prime factors, explain why $\sqrt{1296} = 36$. Calculations must be shown.

[3]



QUESTION 5

5.1. **Write each of the following ratios in their simplest form:**

5.1.1 14:21 _____ **(1)**

5.1.2 114:32 _____ **(1)**

5.1.3 60cm:1,2m _____ **(2)**

_____

5.2 **Complete the following ratio calculations;**

5.2.1 **Divide 63 in the ratio 5 : 4** **(3)**

_____

_____

5.2.2 **Increase R725 in the ratio 5 : 7** **(3)**

_____

_____

5.2.3 **Decrease 520 in the ration 6:5** **(3)**

_____

_____

[13]

QUESTION 6

6.1 **Write down the next two numbers in each of the following sequences:**

6.1.1 **25 ; 24 ; 22 ; 19 ; 15 ; _____ ; _____** **(2)**

6.1.2 **2,97 ; 2,95 ; 2,93 ; 2,91 ; _____ ; _____** **(2)**

6.1.3 $\frac{1}{2}$; $\frac{3}{4}$; $\frac{5}{8}$; $\frac{7}{16}$; _____ ; _____ **(2)**

6.2 **Consider the numbers: 23 ; 17 ; 11 ; 20 ; 14 ; 26**

6.2.1 **Write the numbers in descending order so that they form a pattern. (Start with the number 26)**

_____ **(2)**

6.2.2 **Write down the next two numbers in the sequence:**

_____ **(2)**

6.2.3 **If each number of the sequence is divided by 9 and the remainder is found, then the following pattern is given:**

8 ; 5 ; 2 ; 8 ; _____ ; _____ **(Write down the next two numbers)** **(2)**

[12]

QUESTION 7

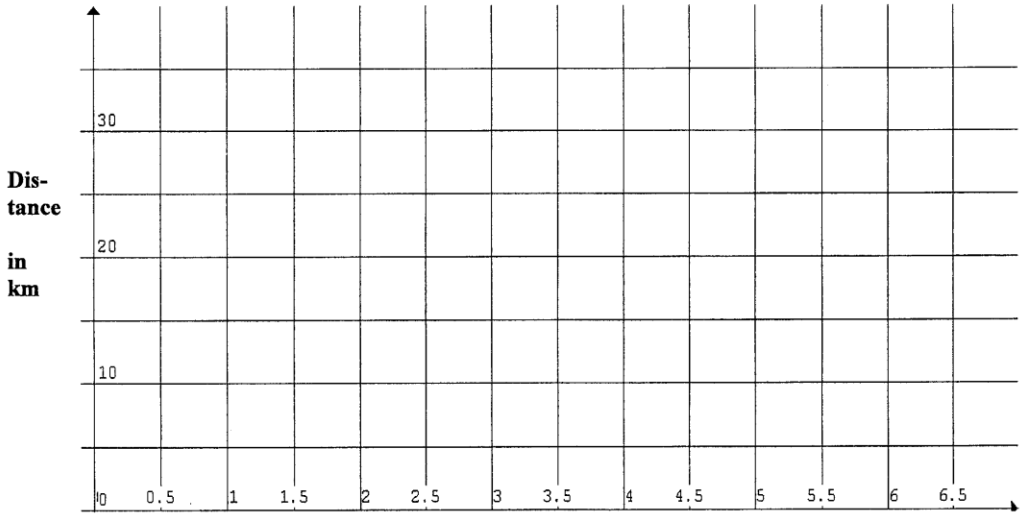
In a cross-country walk, Mr. Dunlop walks at a steady speed.

7.1 Complete the table below to show the distance in kilometers walked (d) after *t* hours.

No. of hours (*t*)	0	1	2	3	4	
Distance in km (*d*)	0	5	10		20	30

(2)

7.2 On the system of axes given below, draw the straight line graph to show how the distance walked changes as time changes. **(3)**

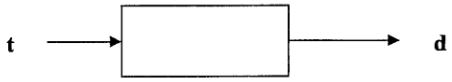


7.3 Use the graph to answer the following questions (show clearly on the graph how you obtained your answer). Readings from the graph may be approximate readings.

7.3.1 What distance was covered after $2\frac{1}{2}$ hours? _____ **(2)**

7.3.2 After how many hours did Mr. Dunlop walk 23 km ? _____ **(2)**

7.4 Complete the diagram given below to show the computing procedure (rule) we could use to calculate the distance (d) that Mr. Dunlop walked given the number of hours (*t*).



(1)

7.5 Now write down the algebraic formula that describes the rule.

_____ **(1)**

[11]

QUESTION 8

8.1 Consider the expression $2(4+y)+3x+5$

8.1.1 How many terms has the expression? _____

8.1.2 Write down the coefficient of x _____

8.1.3 Write down the constant term _____

(3)

8.2 Given $3p^4$. Write down the:

8.2.1 coefficient _____ **1.2.2 power** _____

8.2.3 base _____ **1.2.4 exponent** _____

(4)

8.3 Multiply out and simplify where necessary.

8.3.1 $5(x+3)$ = _____ **(2)**

8.3.2 $3(x+1)+2(3x+4)$ = _____

_____ **(3)**

8.4. Write in simpler (shorter) form:

8.4.1 $3\times p$

(1)

8.4.2 $m\times 4$

(1)

8.4.3 $3a+2a$

(2)

8.4.4 $3a\times 2a$

(2)

8.4.5 $3x^2+2x^2$

(1)

8.4.6 $3x^2\times 2x^3$

(2)

8.4.7 $2\times x\times y$

(1)

8.4.8 $3\times 4x+2$

(2)

8.5 Simplify, if possible:

8.5.1 $x+y+2x+y$

(2)

8.5.2 $xy+yx$

(1)

8.5.3 $3pq+qp+5qp$

(1)

8.5.4 $4x^2y\times 2x^3y$

(3)

8.5.5 $6a + 2 + 3a + 5$

(2)

8.5.6 $3y \times y + 2y \times y$

(2)

8.6 **Write an algebraic expression for each of the following:**

8.6.1 **a number added to 5** _____

8.6.2 **a number multiplied by 7** _____

8.6.3 **Bongani's age in 6 years time if he is y years old now** _____

8.6.4 **the number of days in p weeks** _____

(4)

[39]

QUESTION 9
Solve the following equations:

9.1 $6x + 1 = 19$

(3)

9.2 $\frac{x}{7} = 35$

(2)

9.3 $3x - 8 = -2x + 27$

(3)

9.4 $2(x - 3) + 3(x - 2) - 4 = 0$

(4)

9.5 **If $xy = 63$ and $y + 2 = 9$ find:**

9.5.1 **the value of y**

(1)

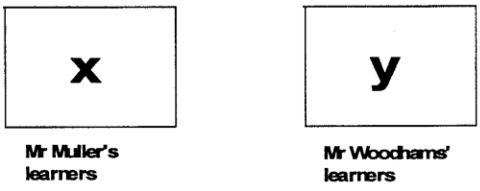
9.5.2 **now find the value of x**

(2)

[15]

QUESTION 10

10.1 There are two classes learning Maths:



Mr Muller has x learners in his class and Mr Woodhams has y learners.

10.1.1 **If one of the learners from Mr Muller's class leaves the school, how many learners will be left in Mr Muller's class?**

_____ **(1)**

10.1.2 **If two new learners are added to Mr Woodhams' class, how many learners will there be in his class?**

_____ **(1)**

10.1.3 **Write an algebraic expression for the sum of learners in Mr Muller and Mr Woodhams' classes, once the changes have been made.**

_____ **(2)**

_____

10.2 South Africa won a Tri-nations Rugby match. Their score consisted of tries (worth 5 points each) and drop goals (worth 3 points each).

10.2.1 Give an equation to find the total points (T) if they scored x tries and y drop goals.

T = _____ **(2)**

10.2.2 Suggest a value for x and y if their total number of points was 24.

x = _____ **and** y = _____ **(2)**

[8]

QUESTION 11

After the first term Mathematical Literacy test was written at Lerato Secondary School, the Head of Department sampled the scripts of 11 learners out of a class of 42. The results of these 11 learners were as follows (out of a total of 50 marks):

22; 16; 45; 35; 40; 25; 42; 37; 41; 35; 27

11.1 Arrange the set of marks in an ascending order. **(3)**

_____

11.2 Determine the mean mark of the learners sampled. **(3)**

_____

11.3 Determine the median mark of the learners. **(1)**

_____

11.4 Determine the mode of the learners' marks. **(1)**

_____

11.5 Calculate the range of the learners' marks. **(2)**

_____

11.6 Convert the mean mark obtained above to a percentage if the test was out of 50 marks (round off the answer to one decimal place). **(2)**

_____

[12]

QUESTION 12

12.1. Convert each of the following to the units in brackets:

12.1.1 **400cm** _____ **(m)**

12.1.2. **1,65km** _____ **(mm)**

12.1.3. **0,62*l*** _____ **(ml)**

12.1.4. **3,45kg** _____ **(g)**

12.1.5. **15m** _____ **(km)** **(5)**

12.2. **At the Inter-house Athletics Meeting, 4 boys take part in the shot put event. Their results are in the table below:**

U14 SHOT PUT	
NAME	**DISTANCE THROWN**
Bryce	**142cm**
Sipho	**1040mm**
James	**0.00153km**
Rajeev	**992mm**

12.2.1. **Convert all the distances to meters**

U14 SHOT PUT	
NAME	**DISTANCE THROWN**
Bryce	
Sipho	
James	
Rajeev	

(4)

12.2.2. **Arrange the measurements in descending order**

_____ **(2)**

12.2.3. **Who won the event?**

_____ **(1)**

12.3. **Write the following in minutes:**

12.3.1. **1 hour and 34 minutes** _____ **(1)**

12.3.2. **2 hours and 56 minutes** _____ **(2)**

12.4. **Arrange the following times from the shortest time to the longest time:**

125 minutes, 2 hours, 2,5 hours, 2 hours 29 minutes

_____ **(3)**

[18]

QUESTION 13

Calculate each of the following. Show ALL working.

13.1) $\frac{2}{3} - \frac{1}{2}$ **(2)**	13.2) $\frac{2}{3} \times \frac{3}{4}$ **(2)**
13.3) $7\frac{5}{8} \div 6\frac{1}{10}$ **(4)**	13.4) $9\frac{4}{5} - 6\frac{1}{10} \times 3\frac{1}{3}$ **(4)**

[12]