

# HILLCREST HIGH SCHOOL



## Grade 8 Mathematics June Exam 2019

Name: \_\_\_\_\_

MARKS: 155

TIME: 2 hours

### INSTRUCTIONS

1. Write your name and your teacher's name on your answer book.
2. This question paper consists of 13 questions. Answer ALL the questions.
3. Number the questions correctly according to the number system used in this question paper.
4. Rule off after each question.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations and steps clearly.
7. Round off ALL final answers to TWO decimal places, unless stated otherwise.
8. Indicate units of measurement, where applicable.

**QUESTION 1**

Consider each of the following statements. In each case, decide whether the statement is true or false. Write only TRUE or FALSE in your answer booklet.

- 1.1 All prime numbers are odd numbers. (1)
- 1.2 All even numbers except 2 are composite. (1)
- 1.3  $5678 \div 0 = 0$  (1)
- 1.4  $(-2)^2 = -4$  (1)
- 1.5  $-941$  is an integer. (1)
- 1.6  $883 > -885$  (1)
- 1.7 The HCF of 48 and 72 is 12. (1)
- 1.8  $\sqrt{16+9} = 7$  (1)
- 1.9  $7xyz$ ;  $4yzx$  and  $6zyx$  are all like terms. (1)
- 1.10  $\sqrt[3]{64} = 2^3$ . (1)
- [10]**

**QUESTION 2**

Consider the following list of numbers.

1; 108; 2; 90; 3; 9; 180; 12; 72; 225; 4; 6

FROM THIS LIST, write down EVERY NUMBER that satisfies each of the following criteria.

- 2.1) Rewrite the list of numbers in ascending order. (2)
- 2.2) Prime numbers (2)
- 2.3) Factors of 36 (2)
- 2.4) Prime factors of 36 (2)
- 2.5) Multiples of 36 (2)
- 2.6) Factors of both 36 and 45 (2)
- 2.7) Multiples of both 36 and 45 (2)
- [14]**

**Question 3**

Calculate the following. Be sure to show all working out.

- 3.1) Write the following numbers as products of their prime factors: (You may find a factor ladder or factor tree useful.)

3.1.1 1000

3.1.2 900

(4)

- 3.2) Now use these answers to find the HCF of 900 and 1000

(2)

- 3.3) Use question 3.1.2 to help calculate  $\sqrt{900}$ . All working must be shown.

(2)

- 3.4) Use question 3.1.1 to help calculate  $\sqrt[3]{1000}$ . All working must be shown.

(2)

[10]

**Question 4**

Without the use of a calculator calculate the answers to the following. Show all working.

4.1)  $-5 - 7$

(1)

4.2)  $8 - (-9)$

(2)

4.3)  $(-5)(-2)(-4)$

(2)

4.4)  $5 + 4 \times (-2)$

(2)

4.5)  $\frac{\sqrt[3]{-64}}{-3-1}$

(3)

4.6)  $\frac{3}{5} \times 2\frac{1}{2}$

(3)

4.7)  $4\frac{1}{2} \div -2\frac{1}{4}$

(4)

[17]

**Question 5**

Express these ratios in their simplest form:

5.1) 18:24

(2)

5.2)  $3\frac{1}{2} : 4\frac{1}{2}$

(2)

5.3) 2,5 kg: 500g

(2)

5.4) 70 minutes :  $1\frac{1}{4}$  hours

(2)

5.5) 2,4 : 1,32

(2)

- 5.6) Jane has 425 songs on her cell phone, Paul has 1210 iPad on his and Eryn has 875 songs on her MP3 player. Write the number of songs each person has as a ratio and simplify it.

(3)

5.7) A donation of R6 450 985, 20 has been made by a business to benefit three organizations, namely the SPCA, Hospice and Gift of the Givers.

5.7.1) Write the amount to be donated in words. (2)

5.7.2) Round off the given amount to the nearest thousand rand. (2)

5.7.3) The money is to be shared by the SPCA, Hospice and Gift of the Givers in a ratio 4:2:5 respectively. Calculate the amount that Hospice will receive. (3)

5.7.4) The SPCA receive R 2 345 812, 80. They use 40 percent of the donation on dog food. Calculate the amount spent on dog food. (2)  
[22]

### Question 6

Consider the following:  $4x^2 - 6y + 3$

6.1.1) What is the correct name for the above expression? (1)

6.1.2) The coefficient of  $y$  is: (1)

6.1.3) What is the constant term? (1)

6.1.4) How many terms are there in the mentioned expression? (1)

6.2) The cost of a cell-phone account at the end of the month depends on different types of calls that were made. A cell-phone company charges a R95 fixed rate, R1,25 per S.M.S and R2,25 per minute for ordinary calls. During a month John spent 85 minutes on calls and sent 15 S.M.S.'s. He wrote down some formulae for working out his account for that month. ( $C$  = Cost)

$$C = 95 + 125x + 225y \qquad C = 1,25x + 2,25x + 95$$

$$C = 1,25x + 2,25y + 0,95 \qquad C = 1,25x + 2,25y + 95$$

6.2.1) Write down which of the formulae above is correct. (1)

6.2.2) How many variables are there in your chosen formula? (1)

6.2.3) Use the formula you have chosen as the correct one to work out his account. (2)  
[8]

**Question 7**

7.1) Refer to the table below and answer the questions that follow

X	→	Y
4	→	21
21	→	<b>a)</b>
7	→	33
<b>b)</b>	→	65
55	→	225

7.1.1) Calculate the value of **a)** (2)

7.1.2) Calculate the value of **b)** (2)

7.1.3) Construct a formula (computing procedure) connecting X and Y (2)

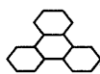
7.2) Match the Number pattern in block 1 with the **correct** general term in block 2. You need only write the correct letter next to the question number in your answer booklet. (4)

Number Pattern	General Term
7.2.1) 2, 5, 10, 17, 26, ..., 82	A) $3n + 4$
7.2.2) 7, 10, 13, 16, 19, ..., 31	B) $6n - 4$
7.2.3) 16, 15, 14, 13, 12, ..., 8	C) $n^2 + 1$
7.2.4) 2, 8, 14, 20, 26, ..., 50	D) $-n + 17$

[10]

**QUESTION 8**

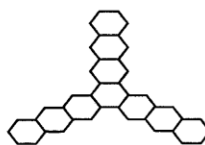
Consider the following figures, created from regular hexagons. As you can see, in Figure 1 there are 4 hexagons, in Figure 2 there are 7 hexagons and in Figure 4 there are 13 hexagons.



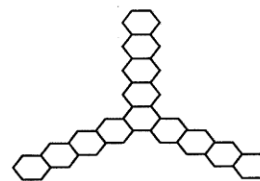
**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

8.1 Complete the following table, assuming that this pattern is continued. Write the values next to the correct numbers on your answer sheet.

Figure Number ( $n$ )	1	2	3	4	5	8
Number of Hexagons ( $h$ )	4	7	8.1.1)	13	16	8.1.2)

(2)

8.2) Determine a formula which links the Figure Number ( $n$ ), with the Number of Hexagons ( $h$ ), allowing you to work out the Number of Hexagons, if you are given the Figure Number. Write your formula in the form  $h = \dots$

(2)

8.3) Assuming this pattern continues, use your formula to determine the number of squares in Figure 104.

(2)

[6]

### Question 9

Convert the following statements into algebraic expressions. Use  $x$  for each unknown.

9.1) A number added to nine. (1)

9.2) Four times a number. (1)

9.3) Half of a number. (1)

9.4) Four less than three times a number. (2)

9.5) Three more than the product of  $x$  and  $y$ . (2)

9.6) A box of chocolates usually contains  $n$  chocolates. The shopkeeper puts an extra 2 chocolates into each box. If a boy buys 4 boxes and then gives 5 chocolates to his friend, how many does he have left in terms of  $n$ ?

(2)

[9]

### Question 10

Substitute the given values into each of the equations and then solve.

If  $a = 4$ ,  $b = -7$  and  $c = 2$ , find the values of:

10.1)  $\frac{a \times b}{c}$  (2)

10.2)  $3 \times a + 4 \times b$  (2)

10.3)  $5(3b + c)$  (3)

[7]

**Question 11**

Simplify the following expressions:

11.1)  $9xyz + 4yzx$  (2)

11.2)  $11c - 7 \times c$  (2)

11.3)  $3t \times 4 - 8t \div 2$  (3)

11.4)  $3a - 5b - 4a + b$  (2)

11.5)  $4(2p + 8r) + 3(3p - 5r)$  (3)

11.6)  $\frac{9g-3h+27}{3}$  (3)

11.7)  $\frac{5(7f-3f+6)}{10} - f - 3$  (4)

[19]

**Question 12**

Solve for the unknown in each following equations:

12.1)  $2f + 13 = 15$  (2)

12.2)  $6k + 2 - 4k = 26$  (2)

12.3)  $4b + 4 + 5b = 3(2b + 7)$  (3)

12.4)  $(12 - 2r) \div 2 = 6$  (3)

12.5)  $8(s - 3) = 6(s - 1)$  (4)

[14]

**Question 13**

Simplify as far as possible:

13.1)  $-3(x^2 + 2x - 3) + 3x^2$  (3)

13.2)  $(-8y^6) \div 4y^3$  (2)

13.3)  $(-3a^2b^3c)(-4abc^2)^2$  (4)

[9]

{ END: 155 }