Hillcrest High School

Grade 8

MATHEMATICS

JUNE 2023

MARKS: 130
TIME: 2 Hours

EXAMINER: Ms. G.Stow
MODERATOR: Mrs S.Moodley

NAME :	CLASS:
TEACHER:	DATE:

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Total
8	7	9	4	4	4	4	12	18	5	38	5	12	130

Instructions:

1. This assignment consists of **13** questions.
2. Answer ALL the questions in the space provided.
3. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
4. Answers only, will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
7. Write neatly and legibly.

Question 1

Multiple Choice.

Choose the correct answer and write the corresponding letter in the Answer column.

Answers:

1.1 Write $2mp^2$ without numbers:

A. $m + m + p + p$	B. $m + m \times p \times p$
C. $m \times m \times p \times p$	D. $(m + m) \times p \times p$

1.2 252 written as a product of its prime factors:

A. $2^2 \times 3 \times 7$	B. $2^2 \times 3^2 \times 7$
C. 2×126	D. $1 \times 2^2 \times 3^2 \times 7$

1.3 $3030\,000$ written in Scientific Notation:

A. $3{,}03 \times 10^6$	B. $3{,}03000 \times 10^7$
C. $0{,}303 \times 10^7$	D. 303×10^4

1.4 The next term in the sequence $81 ; 41 ; 21 ; 11$ is:

A. 1	B. 4
C. 5	D. 6

1.5 Julius has 72 sheep. He wants to divide his sheep into four different fields in a ratio of $1 : 5 : 3 : 3$ respectively. How many sheep will be in the third field.

A. 6	B. 30
C. 24	D. 18

1.6 Remove brackets and simplify: $-x - (-4x)$:

A. $-4x^2$	B. $-5x$
C. $3x$	D. $4x^2$

1.7 $27{,}85374$ rounded to the nearest thousandth is:

A. $27{,}85474$	B. $27{,}854$
C. $27{,}853$	D. $27{,}850$

1.8 The symbol missing between $18 - 7 \square - (18 - 7)$ is

A. $>$	B. $<$
C. $=$	D. $\geq$

[8]

Question 2

State whether the following statements are True or False:

	Statement	True or False
2.1	$-4 \times -8 = -32$	
2.2	12 increased by twice a number is = $12x + 2$	
2.3	$-\frac{1}{4}$ is an integer	
2.4	$3xy.6x^2y = 9x^3y$	
2.5	The coefficient of $5x^3y^4$ is 5	
2.6	The ratio of 5 : 30 in simplest form is 6 : 1	
2.7	An expression with 2 terms is called a binomial	

[7]

Question 3

The following set of numbers is given:

$$\{\mathbf{0}\ ;\ \mathbf{1}\ ;\ \mathbf{2}\ ;\ \mathbf{3}\ ;\ \mathbf{5}\ ;\ \mathbf{8}\ ;\ \mathbf{15}\ ;\ \mathbf{16}\ ;\ \mathbf{24}\}$$

Use only the number/s in the given set to list the following:

3.1 The factors of 16 (2)

3.2 The prime factors of 15 (2)

3.3 The square of 4 (1)

3.4 Multiples of 5 (2)

3.5 Lowest common multiples of 6 and 8. (1)

3.6 Highest common factors of 6 and 8 (1)

[9]

Question 4

4.1 Arrange the following in ascending order: (2)

$$-5\,;3\,;\,-2\,;\,-12\,;7\,;2$$

4.2 Arrange the following in descending order: (2)

$$12\,\times 10^{6}\;\;;\;\;12\,000\;\;;\;\;1{,}2\,million\;\;;1{,}2\,\times 10^{5}$$

[4]

Question 5

Calculate $\sqrt{784}$ using prime factors. ALL working must be shown.

[4]

Question 6

Use the given numbers to answer the questions that follow.

6.1 **Round off $125,5487$ to:**

a. Three decimal places (2)

b. The nearest ten

6.2 **Round off 539,985 to:**

a. 2 decimal places (2)

b. the nearest thousand

[4]

Question 7

Determine the highest common factor and lowest common multiple of 14 and 50.

[4]

Question 8

Simplify the following, showing all steps of working. Leave your answer as a simplified, improper fractions, where necessary.

8.1 $(-2)^2 - (4 - 3 \times 2)$ (4)

8.2 $\dfrac{-(-7-3)}{-2^2 - \sqrt{36}}$ (4)

8.5 Simplify, without using a calculator, leaving your answer in Scientific Notation (4)

$$\frac{-4 \times 10^4 \times 9 \times 10^4}{3 \times 10^7}$$

[12]

Question 9

Answer the following questions. Be sure to show all working.

9.1 Simplify the following ratio (2)

$$45 : 18$$

9.2 The ratio of cats : dogs in a vet on a particular morning was 4 : 5. If there were 60 dogs, answer the following questions:

9.2.1 How many cats where at the vet? (2)

9.2.2 How many animals were there in total (if there are only cats and dogs at the vet)? (2)

9.3 Mr Jack has 3 children. Their ages are 2; 3 and 5 years old. Mr Jack wins some money in a competition and decides to share R 45 000 between the children in a ratio of their ages. Determine the amount of money the oldest child gets. (3)

9.4 Write the following ration in simplest form: (3)

$$12 : 30 : 54$$

9.5 Buhle was not well and therefore needed to increase her medicine in a ratio of 4 : 5. If she was taking 20ml of cough syrup how much must she now take? (3)

9.6 If $\frac{2}{5}$ of a line is 8cm, what is the full length of the line? (3)

[18]

Question 10

Given the expression below, answer the questions that follow:

$$\boldsymbol{x^3 + 2x^4 + 3 - 7x^2}$$

10.1 Write down the term with the **smallest coefficient**. (1)

10.2 Write down the co-efficient of the term that has a variable with an exponent of 4. (1)

10.3 Give the constant of the expression (1)

10.4 Find the value of $-7x^2$ if $x = -3$ (2)

[5]

Question 11

Simplify the following as far as possible. All steps of working must be shown.

11.1 $10 - 10x$ (1)

11.2 $6x - 3 - 8x + 4$ (2)

11.3 $x^3 - 2x^3$ (1)

11.4 $(x^4)(-4x)$ (2)

11.5 $2x^4 \div 0$ (1)

11.6 $(3x)^2(2xy)(y^2)^2$ (4)

11.7 $a^2b + b^2a - 4ab^2 + 2ba^2$ (2)

11.8 $\frac{-14x^4y^3}{20x^8y}$ (3)

11.9 $-2x(x-3x+2x)$ (2)

11.10 $\dfrac{12x^6+9x^4-3x}{3x}$ (4)

11.11 $4(x+y)-8x(3-y)$ (4)

11.12 $(3^{2x})^2$ (2)

11.13 $\frac{4x^2y}{3xz} \div \frac{24y^5z}{15z^3}$ (5)

11.14 $-2a(3+a) + \frac{2(4a-6)}{4}$ (5)

[38]

Question 12

If $a = 2$ and $b = -3$, find the value of the following, showing all steps of working:

12.1 $2ab$ (2)

12.2 $\frac{2b^2}{3a - b}$ (3)

[5]

Question 13

13.1 Given the following number sequence, find the next two terms: (2)

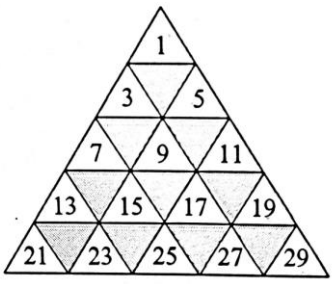
3 ; 7 ; 11 ; 15 ; ... ; ...

13.2 Given the following number sequence, find the value of the missing terms: (2)

2 ; 5 ; 11 ; ... ; 47 ; 95 ; ...

13.3 Find the **fourth, fifth and sixth term** of the number pattern which has the following formula: $n^2 - n + 1$ (4)

13.4 The diagram below shows a number pattern. (4)



Use the diagram to complete the table below.

Row number	1	2	3	4	6
Sum of the number in a row	1				

Space for your calculations has been provided:

[12]