Hillcrest High School

Grade 9

MATHEMATICS

JUNE 2023

MARKS: 125

TIME: 2 Hours

EXAMINER: Mrs J. Leuschke

MODERATOR: Mrs M. Woodrow

Question	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Max Mark	8	4	15	8	9	13	5	22	6	18	13	4	125
Mark													

Instructions:

Read the following instructions carefully before answering the questions.

1. This examination consists of 12 questions.

2. Answer ALL the questions in the space provided.

3. Clearly show ALL calculations 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

Match the expression or term in column A with the most appropriate answer in column B. Each answer may only be used once. Write the answer from Column B under the correct letter From Column A in the table below. (8)

A	B
a) A negative rational number	A) 30
b) An irrational number	B) $\frac{3}{2}$
c) An integer.	C) **–3, 3**
d) A factor of 30	D) $\sqrt{3}$
e) The square root of 9	E) $\sqrt{-3}$
f) $\sqrt[3]{3\frac{3}{8}}$	F) $\frac{1}{3}$
g) A non – real number	G) 3
h) $0,\dot{3}$	H) **–3**

a)	b)	c)	d)	e)	f)	g)	h)

Question 2

(MULTIPLE CHOICE): Answer the following question in the table provided on at the end of Question 2. (4)

2.1. Which number is NOT equivalent to $4\frac{1}{3}$

A) $\frac{13}{3}$ (B) $\frac{13}{4}$ (c) $\frac{39}{9}$ (d) $\frac{117}{27}$

2.2. The simplified form of $5(x-3)+7$ is

A) $5x+20$ (B) $-15x+7$ (c) $5x-8$ (d) $-15x+35$

2.3. The Highest Common Factor (HCF) of 24 and 36 is

A) 2 (B) 12 (c) 72 (d) 6

2.4. The PRIME factors of 14 are

A) $1; 2; 7\ and\ 14$ (B) $1\ and\ 7$ (c) $1; 2\ and\ 7$ (d) $2\ and\ 7$

2.1	2.2	2.3	2.4

Question 3

3.1.1 Express 576 as a product of its prime factors. (2)

3.2 Find $\sqrt[3]{\mathbf{5832}}$ by using the product of prime factors. (Without the use of a calculator) (3)

3.3 Convert $\frac{8}{11}$ to the following :

3.3.1 a decimal (1)

3.3.2 a percentage (2)

3.4 write the following ratios in their simplest form.

3.4.1 12 : 15 : 24 (3)

3.4.2 0,8kl : 2,4kl (2)

3.5.1 Round 0,0067 to two decimal places _____ (1)

3.5.2 Round 94,1464 to one decimal place _____ (1)

[15]

Question 4

Simplify each of the following without the use of a calculator.

4.1 $3 \times -3 + -2 \times 1$ (2)	4.2 $-3 \times 0 + -3 \times 1$ (2)
4.3 $(2 \times -3)^2$ (2)	4.4 2×-3^2 (2)

[8]

Question 5

5.1 R900 is shared between Cindy and Thato. Cindy gets R15 for every R35 that Thato gets. Calculate how much each one gets. (4)

5.2 A pair of shoes that is marked at R450,00 is now sold at a discount of 13%. Determine the selling price. (3)

5.3 A car travels for 3 hours at an average speed of 65km/hr. How far does the car travel? (2)

[9]

Question 6

Simplify the following:

6.1 $-3x(2x + 3)$ (2)

6.2 $(5 + 3p)(2 - q)$ (2)

6.3 $(x + 5)(x - 4)$ (3)

6.4 $(x + 3)^2$ (2)

6.5 $5x\,(2x - 5) - 3x\,(2x - 1)^2$ (4)

[13]

Question 7

Study the following expression and answer the questions that follow:

$$4a^2 - 3a^4 + 7a + 9a^5 - 13 + a^6$$

7.1 How many terms are there in this expression? (1)

7.2 What is the numerical coefficient of a^5? (1)

7.3 Write down the degree of the polynomial. (1)

7.4 Re-arrange the polynomial in ascending order of powers of a. (2)

[5]

Question 8

8.1 Each of the following statements have parts that are missing. Rewrite each statement so that each one is true:

8.1.1 $(x \ \ldots\ldots\ldots)(x+4) = x^2 - 16$ (1)

8.1.2 $3a^2b - \ \ldots\ldots\ldots\ = 3ab(\ldots\ldots\ldots - 2b)$ (2)

8.1.3 $x^2 \ - \ldots\ldots\ldots + \ldots\ldots\ldots = (x-5)(\ldots\ldots\ldots - 3)$ (3)

8.2 Factorise the following fully

8.2.1 $4a^2 - 8a$ (2)

8.2.2 $9r^2t^2 - k^2$ (2)

8.2.3 $2ax - 3a - 10x + 15$ (3)

8.2.4 $5b^5 - 5b$ (4)

8.2.5 $x^2 + 14x + 40$ (2)

8.2.6 $2x^2 + 4x - 6$ (3)

[22]

Question 9

9.1 Write each of the following in scientific notation.

9.1.1 16 000 000 (2)

9.1.2 0,00625 (2)

9.2 Write 5,081 x 10^9 in the standard form. (2)

[6]

Question 10

In each of the following, solve for the unknown:

10.1 $3x + 6 = 3(x + 2)$ (2)

10.2 $5x + 4 = 3x - 10$ (2)

10.3 $(x + 3)(x - 3) = x(x + 3)$ (3)

10.4 $\frac{x+1}{3} - \frac{x-2}{5} = \frac{30}{15}$ (4)

10.5 $\mathbf{5^x = 125}$ (2)

10.6 $\mathbf{2^{x-1} = 1}$ (3)

10.7 $x^4 = 81$ (2)

[18]

Question 11

Simplify each of the following.

11.1 $\frac{-4p^{-4}q^3r^2}{p^2q^{-2}r^8}$ (3)

11.2 $\frac{(3xy^3)^2}{18x^{-2}y^4}$ (3)

11.3 $\frac{(2^2q^{-3})^0x\,(p^{-3}q)^{-2}}{(-2pq^{-1})^2}$ (4)

11.4 $\sqrt[3]{64x^9y^3}$ (3)

[13]

Question 12

There is a relationship between x and y in the table below.

X	8	12	50	78	q
y	20	30	125	p	25

12.1 Is this a direct or indirect relationship? Give a reason for your answer. (2)

12.2 Determine the values of p and q. (2)

[4]