HILLCREST HIGH SCHOOL

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INTERNAL EXAM

GRADE 9

MATHEMATICS

JUNE 2022

EXAM

NAME: _____ **CLASS:**____

TIME: 2 Hours MARKS: 120

This question paper consists of 12 pages.

QUESTION	1	2	3	4	5	6	7	TOTAL
MARK	20	12	21	17	18	16	16	120

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This examination consists of **7** 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. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.

QUESTION 1

Fill in the table below with the letter that corresponds with the correct answer:

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10

1.1	Give the equivalent amount to $\frac{3}{5}$ a) 0,6 b) $\frac{21}{28}$ c) 0,06 d) 0,006	(2)
1.2	Given the expression $-6x^4 + \frac{1}{2} + 3x - 5$ What is the co-efficient of x^4 a) 6 b) -6 c) 3 d) -5	(2)
1.3	What is the value of $b^2 - 4ac$, if $a = -1,\ b = 3,\ c = \frac{1}{4}$ a) 8 b) 10 c) 2 d) 9	(2)
1.4	From the following list, which two terms are like terms: $4t^2\ ;\ -2t^3\ ;\ 3\ ;\ -2t^2$ a) $4t^2\ ;\ -2t^3$ b) $4t^2\ ;\ -2t^2$ c) $-2t^2\ ;\ -2t^3$ d) $-2t^3\ ;\ 3$	(2)

1.5	Calculate the answer for the following: $\sqrt{16x^{16}}$ a) $8x^4$ b) $8x^4$ c) $16x^8$ d) $4x^8$	(2)
1.6	If you expand $(x-4)^2$, your answer will be: a) x^2-8 b) x^2-16 c) $x^2-4x+16$ d) $x^2-8x+16$	(2)
1.7	Solve the following: $-20x-5=35$ a) -2 b) 2 c) 0,67 d) 5	(2)
1.8	Calculate the following: $\frac{x^2y}{xy^2} \div \frac{x}{y}$ a) $\frac{x}{y}$ b) $\frac{x^2}{y^2}$ c) $\frac{xy^2}{x^2y}$ d) 1	(2)

1.9	Factorise $x^2 + 5x - 6$ a) $(x + 2)(x + 3)$ b) $(x - 2)(x - 3)$ c) $(x - 1)(x + 6)$ d) $(x - 6)(x + 1)$	(2)
1.10	It takes Randy 40 minutes to travel to his friends house which is 60km away. After half an hour of travelling, how far is he from his friends house? a) 10km b) 15km c) 30km d) 45km	(2)
		[20]

QUESTION 2

2.1	Consider the following numbers and then answer the questions that follow: $\frac{-12}{4}$ $-5{,}64$ $\sqrt{-4}$ $\sqrt[3]{25}$ 6 From the list write down:	
2.1.1	A Whole number	(1)
2.1.2	An integer	(1)
2.1.3	An irrational number	(1)
2.1.4	A non-real number	(1)

2.1.5	A rational number	(1)
2.2	Rewrite 1728 as a product of prime factors	(2)
2.3	Using prime factors, determine the lowest common multiple of: 54 : 36	(3)
2.4	Round 999 999 to the nearest 1 000	(1)
2.5	Convert $\frac{2}{3}$ to a percentage. Correct to 2 decimal places	(1)
		[12]

QUESTION 3

3.1	Simplify the following. Show all working. Answers only may not be awarded full marks	
3.1.1	$\frac{1}{2} + 3\frac{1}{4}$	(3)

3.1.2	$\frac{2}{3} \times \frac{3}{6}$	(2)
3.1.3	$\frac{4}{5} \div \frac{2}{25}$	(3)
3.1.4	10cm : 2,5m	(2)
3.2	Divide R1 500 in the ratio 2 : 3	(2)
3.3	What distance have I covered if I drove 120km/hour for 3,5 hours?	(2)
3.4	How long did it take Mary if she drove at a distance of 485 km at a speed of 115km/h. Give the time in hours and minutes	(4)

3.5	It took Sam 16 litres of fuel to cover 400km. How far can he drive on 25 litres of fuel?	(3)
		[21]

QUESTION 4

4.		Simplify the following, leaving in positive exponential form.	
4.1		$6x^3 \times 6x^5$	(2)
4.2		$4b^3 + 2b^3$	(2)
4.3		Calculate the following. Leave your answer in scientific notation. $(2{,}3 \times 10^3) \times (1{,}5 \times 10^3)$	(2)
4.4		$x^5 \div x^2$	(2)
4.5		$\frac{12a^4b^6c^4}{4a^2b^6}$	(3)

4.6		$\frac{-4t^6p^{-3}}{8t^3p^6}$	(3)
4.7		$\sqrt{64b^6} - \sqrt{36b^6}$	(3)
			[17]

QUESTION 5

5.1		The polynomial $-5x^3 + 6xy + 7 - 2x^2$ is given:	
5.1.1		How many terms are there?	(1)
5.1.2		What is the constant term?	(2)
5.1.3		What is the degree of expression in terms of *x*?	(1)
5.1.4		Arrange the expression in descending powers of *x*.	(2)

5.2		Expand and simplify	
5.2.1		$3a^4b(4a^2 - 2b - c)$	(3)
5.2.2		$x(x-2) - 4x(x-3)$	(4)
5.2.3		$(3x-1)\,(2x+5)$	(3)
5.2.4		$\left(t + \frac{1}{4}\right)\ (t - \frac{1}{4})$	(2)
			[18]

QUESTION 6

6.		Fully factorize the following:	
6.1		$3x - 15xy$	(2)

6.2		$3(x-3)+a(x-3)$	(2)
6.3		$2a^2bc^4-6a^3b^3c+8abc$	(3)
6.4		$x^2-10x+24$	(2)
6.5		$7x^2+14x+7$	(3)
6.6		$4x^2-\frac{1}{9}$	(2)
6.7		a^3-ab^2	(2)
			[16]

QUESTION 7

7.		Solve for x	
7.1		$4x - 8 = 10 - 2x$	(3)
7.2		$3(4 - x) + 2x = (4x + 3)2$	(3)
7.3		$\frac{2x}{3} - \frac{x}{6} = \frac{3}{2}$	(4)
7.4		$\frac{2x}{3} - \frac{x-3}{6} = x - \frac{3x+1}{2}$	(6)
			[16]

End