HILLCREST HIGH SCHOOL

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INTERNAL EXAM

GRADE 9

MATHEMATICS

JUNE 2021

EXAM

Name: _____ Class:____ MARKS: 123

TIME: 2 Hours

This question paper consists of 10 pages.

QUESTION	1	2	3	4	5	TOTAL
MARK	40	23	16	22	22	123

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This examination consists of 5 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

1.1	From the list of numbers below, write down **all** the:	
	-9 ; $\sqrt{2}$; 7 ; $\frac{4}{5}$; $\sqrt{16}$; 0 ; π ; -314	
1.1.1	Natural numbers:	(1)
1.1.2	Integers:	(2)
1.1.3	Irrational numbers:	(1)
1.2	Write the following ratios in their simplest form:	
1.2.1	120 : 60	(2)
1.2.2	35kg : 500g	(3)
1.2.3	0,02 : 0,6	(3)
1.2.4	James, Connor and Ryan have to split R100 000 in the ratio 5 : 2 : 3. How much money would Ryan get?	(3)
1.2.5	If Ben was driving at a constant speed of 120km/h for 6 hours, what distance has he travelled?	(2)

1.2.6	If it takes 8 men to tile a building in 5 days, how many days will it take 10 men?	(2)
1.3	Simplify the following, showing **all** working:	
1.3.1	$\sqrt{25} + \sqrt{16}$	(2)
1.3.2	$\frac{5}{a} - \frac{2}{a} + \frac{4}{a}$	(2)
1.3.3	$6 + 2 \times 4 + (8 \times -3)$	(2)
1.3.4	$(2\frac{1}{3} - 1\frac{1}{4}) \div 6\frac{1}{2}$	(4)
1.4	Convert $\frac{3}{5}$ into a decimal:	(1)
1.5	Convert $\frac{8}{17}$ into a percentage rounded to 2 decimal places, showing all working:	(2)

1.6	Write down 252 as the product of its prime factors.	(2)
1.7	What number do you have to multiply 252 by, to make it a perfect square? :	(2)
1.8	Round 27,978 to 2 decimal places:	(1)
1.9.1	Write $5{,}8\times 10^{-5}$ in general notation:	(1)
1.9.2	Convert 2 795 000 000 to scientific notation:	(2)
		[40]

QUESTION 2

2.1	The polynomial $\mathbf{4a^2-3a^4+7a+9a^5-13+a^6}$ is given :	
2.1.1	How many terms does this polynomial have?	(1)
2.1.2	What is the numerical coefficient of a^4 ?	(1)
2.1.3	Write down the degree of the polynomial.	(1)
2.1.4	Arrange the polynomial in ascending powers of a.	(2)

2.2	Expand and simplify :-	
2.2.1	$-3x(2x+3)$	(2)
2.2.2	$x(x-3)-2x(x-5)$	(3)
2.2.3	$(2x-3)(x+1)$	(2)
2.2.4	$(x-6)^2$	(3)
2.2.5	$\frac{3x^2y}{2} \div \frac{6x^3}{8y}$	(4)
2.2.6	Calculate the value of $3x^3-2x^2-9x+2 \quad if\ x=-2$	(3)
2.3	If John's age is x. What will his age be in 5 years time be, in terms of x ? :	(1)
		[23]

QUESTION 3

	Simplify, leaving in positive exponential form (show all working) :-	
3.1	$\frac{4a^3b^2c^2}{8a^2b}$	(2)
3.2	$(12x^2 \times 2x)^0$	(1)
3.3	$2^4 \times 2^3$	(2)
3.4	$(-5w^4)^2$	(2)
3.5	$(3x^3)^2 \times (2x^2)^4$	(3)
3.6	$\sqrt{100x^4} - \sqrt{81x^4}$	(3)
3.7	$(\frac{-2p^4q^{-2}}{4p^{-6}})^3$	(3)
		[16]

QUESTION 4

4.		Factorise the following fully:	
4.1		$6ab + 8ac$	(2)
4.2		$4m^4 - 6m^3 - 2m^2$	(2)
4.3		$x^2 - 9$	(2)
4.4		$x^2 - \frac{1}{16}$	(2)
4.5		$x^2 - 15x + 36$	(2)
4.6		$3x^2 - 9x - 30$	(4)
4.7		$\frac{3x^3 - 16x}{x - 2}$	(3)
4.8		9t – 8t + 9ms – 8ms	(3)

4.9		$t^2(x-y)-w^2(y-x)$	(3)
			[22]

QUESTION 5

5.		Solve the following equations fully:	
5.1		$3x+5=11$	(2)
5.2		$2x+8=6x-1$	(3)
5.3		$2(3x-1)+2=5x+3$	(3)
5.4		$x-3(1-x)=x+12$	(3)

5.5		$2(5m+3)-(2m+4)=2(3m+6)$	(4)
5.6		$\frac{x}{3}-\frac{x}{2}=4$	(3)
5.7		$\frac{x-2}{4}-x=\frac{x-1}{2}+\frac{3}{4}$	(4)
			[22]

End