MATHEMATICS		GRADE	8
MID-YEAR CONTROLLED TEST			
MARK ALLOCATION	60	TOPIC/CONTENT	Whole Numbers Integers Common Fractions Decimal Fractions Exponents Numeric and Geometric Patterns Functions and Relationships Algebraic Expressions
TIME ALLOCATION	75 minutes	DATE	June 2025

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions:

1. This Controlled Test consists of FIVE questions. Answer ALL the questions.
2. Clearly show ALL the calculations, diagrams, tables etc. you have used in determining the answers.
3. An approved calculator may be used, unless stated otherwise.
4. If necessary, ALL answers should be rounded off to **TWO** decimal places, unless stated otherwise.
5. Number the answers EXACTLY as the questions are numbered in the question paper.
6. Answer your questions in BLUE ink.
7. Write legibly and neatly.

QUESTION 1

1. Various possible options are provided as answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1 to 1.5) in the ANSWER BOOK.

1.1 What is the additive and multiplicative inverse of $\frac{1}{3}$?

A $-\frac{1}{3}$ and -3

B $-\frac{1}{3}$ and 3

C $\frac{1}{3}$ and -3

D $\frac{1}{3}$ and 3

1.2 Which fraction is equivalent to 40%?

A $\frac{4}{100}$

B $\frac{2}{50}$

C $\frac{2}{5}$

D $\frac{40}{1\,000}$

1.3 What is the exponent of the term with the largest coefficient in the expression $-4x^3 - 3x^2 - x + 7$?

A 0

B 1

C 2

D 3

1.4 Simplify: $3^2 \times 3^4 = \ldots$

A 3^4

B 3^8

C 3^2

D 3^6

1.5 The table represents the relationship between x and y. What is the value of a?

x	y
2	3
3	5
4	a
5	12

A 6

B 7

C 8

D 9

[5]

QUESTION 2

2.1 Calculate the HCF of 1 800; 375 and 300 through prime factorisation? (2)

2.2 A local running club has decided to have a race. The race costs R65 to enter. The club will keep 20% of each entrance fee and the remaining funds will be given as 1st, 2nd and 3rd place prizes. If 1 260 people enter and the remaining funds are split into a ratio 3 : 2 : 1 for the first, second and third place, how much money does the first-place winner receive? (4)

2.3 Peter buys a smart TV on a hire purchase loan for R18 000. He pays a 20% cash deposit and repays the remainder of the loan by equal monthly payments over a period of 2 years. The interest is 16% p.a. simple interest on the full amount of the loan. Determine the monthly repayments. (4)

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QUESTION 3

3.1 Simplify the following without the use of a calculator. Show all calculations.

3.1.1 $\sqrt[3]{\frac{64x^6}{27}}$ (1)

3.1.2 $\sqrt{3\frac{3}{8}-\left(\frac{5}{2}\right)^2}$ (3)

3.1.3 $2\frac{1}{3} \div \frac{14}{5} \div \frac{10}{3}$ (3)

3.2 Convert the decimal fraction $0{,}625$ to a percentage. (1)

3.3 Calculate the following without the use of a calculator. Show all calculations.

3.3.1 $-(0{,}0004)^2$ (1)

3.3.2 $3{,}6 \div 0{,}02$ (2)

3.4 If $\frac{2}{5}$ of the production in a week is 22 000 items, then what is 15% of the number of items? (3)

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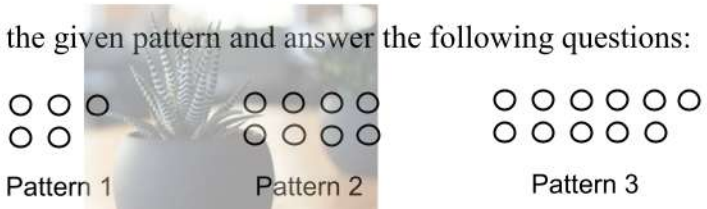
QUESTION 4

4.1 Look at the given pattern and answer the following questions:

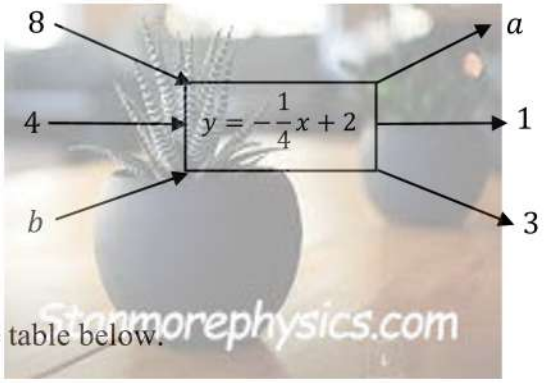


4.1.1 How many dots will there be in the 4th and 5th pattern? (2)

4.1.2 Determine the number of dots in the 85th pattern. (3)

4.2 For the number pattern: $-1;\ 2;\ -4;\ \ldots;\ \ldots$ write down the next two terms. (2)

4.3 Use the given rule to determine the missing input and output values. (2)



4.4 Consider the table below:

x	-4	-2	-1	0	3	5	8	q
y	-21	-13	-9	-5	7	15	p	39

4.4.1 Determine the rule in the form $y = \ldots$ that shows the relationship between x and y. (2)

4.4.2 Use the rule in 4.4.1 to determine the values of p and q (2)

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QUESTION 5

5.1 Calculate the following without the use of a calculator. Show all calculations.

5.1.1 $-6 + \sqrt{4} \times (4 - 9) - (-5)$ (3)

5.1.2 $-3^2 \times \sqrt{9 + 16} + \frac{-3 \times 2^3}{-2-6}$ (3)

5.2 Simplify the following.

5.2.1 $a \times b \times a^2 \times b^3$ (1)

5.2.2 $\frac{3x^2 \times 4xy^7}{2x^2y \times 6x \times y}$ (2)

5.2.3 $\left(\frac{-2x^2y^2}{xy}\right)^3 + (2xy)^0$ (2)

5.3 Consider the expression and answer the following questions.

$$-3x^4 + 12x^2 - 5x^3 - \frac{1}{3}x - 5$$

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

5.3.2 What is the coefficient of the term in x? (1)

5.4 Simplify the expression: $4x - 8y - 3z + x - y + z + 3y + 2z$. (2)

5.5 If $a + b = 16$; $b + c = 14$ and $a + c = 10$, determine the value of $(a + b + c)^3$. (3)

[18]

MARKING GUIDELINES/ NASIENRIGLYNE	
KWARTAAL/TERM 2	**WISKUNDE/MATHEMATICS**
GRAAD /GRADE: 8	
MID-YEAR CONTROLLED TEST/ HALFJAARLIKSE KONTROLE TOETS	
ASSESSERINGSTAAK: 4 **ASSESSMENT TASK: 4**	**INHOUD:** Telgetalle, Heelgetalle, Eksponente, Gewone Breuke, Desimale Breuke, Numeriese en Meetkuduge Patrone, Algebraïese Uitdrukkings, Funksies en Verwantskappe **TOPIC:** Whole Numbers, Integers, Exponents, Common Fractions, Decimal Fractions, Numeric and Geometric Patterns, Algebraic Expressions, Functions and Relationships
PUNTETOEKENNING/ **TOTAL MARKS: 60**	**TYDSDUUR/ TIME ALLOCATION:** 75 minutes

SOLUTIONS/ANSWERS/ OPLOSSING/ANTWOORD		**MARK ALLOCATION/ PUNTE TOEKENNING**	**Levels /Vlak**
QUESTION/VRAAG 1			
1.1	B ✓	✓ answer/ antwoord (1)	K
1.2	C ✓	✓ answer/ antwoord (1)	K
1.3	B ✓	✓ answer/ antwoord (1)	K
1.4	D ✓	✓ answer/ antwoord (1)	K
1.5	C✓	✓ answer/ antwoord (1)	K
			[5]
QUESTION/VRAAG 2			
2.1	$1\,800 = 2^3 \times 3^2 \times 5^2$ $375 = 3 \times 5^3$ $300 = 2^2 \times 3 \times 5^2$ HCF/ GGD $= 3 \times 5^2$ ✓ $= 75$ ✓	✓ method/ metode ✓answer/ antwoord (2)	RP
2.2	Total entance fees/ Totale toegangsfooie = R1 260 × 65 = R81 900 ✓ Total prize money/ Totale prysgeld $= \frac{80}{100} \times \frac{81\,900}{1}$ $= R65\,520$ ✓	✓ total entance fees/ totale toegangsfooie ✓ total prize money/ totale prysgeld ✓ one part/ een deel	CP

	Total parts/ Aantal dele = 3 + 2 + 1 = 6 1 part/ een deel = $\frac{65\,520}{6} = R10\,920$✓ 1st place/ 1ste plek = $3 \times R10\,920$ $= R32\,760$ ✓	✓answer/ antwoord (4)	
2.3	Cash deposit/ Kontant deposito = 18 000 × $\frac{20}{100}$ = R3 600 ✓ Loan amount/ Leningsbedrag = R18 000 – R3 600 = R14 400 Interest/ Rente = 14 400 × $\frac{16}{100} \times 2$ = R4 608 ✓ Total owing/ Bedrag verskuldig = R14 400 + R4 608 = R19 008 Monthly repayments/ Maandelikse terugbetalings = $\frac{19\,008}{2\times12}$ ✓ $= R792$ per month/ per maand✓	✓ cash deposit/ kontant deposito ✓ interest/ rente ✓ $\frac{19\,008}{2\times12}$ ✓ answer/ antwoord (4)	CP
			[10]
QUESTION/VRAAG3			
3.1.1	$\sqrt[3]{\frac{64x^6}{27}}$ $= \frac{4x^2}{3}$✓	✓ answer/ antwoord (1)	K
3.1.2	$\sqrt[3]{3\frac{3}{8} - \left(\frac{5}{2}\right)^2}$ $= \sqrt[3]{\frac{27}{8} - \frac{25}{4}}$✓ $= \frac{3}{2} - \frac{25}{4}$ $= \frac{6}{4} - \frac{25}{4}$ ✓ $= -\frac{19}{4}$ or/of $-4\frac{3}{4}$ ✓	✓ simplification/ vereenvoudiging ✓ simplification/ vereenvoudiging ✓ answer/ antwoord (3)	RP
3.1.3	$2\frac{1}{3} \div \frac{14}{5} \div \frac{10}{3}$ $= \frac{7}{3} \times \frac{5}{14} \times \frac{3}{10}$ ✓✓ $= \frac{1}{4}$ ✓	✓conversion/ herleiding ✓ reciprocal/ resiprook ✓ answer/ antwoord (3)	RP

3.2	$\frac{625}{1\,000} = \frac{62,5}{100} = 62,5\%$ ✓	✓ answer/ antwoord (1)	K
3.3.1	$-(0,0004)^2$ $= 0,00000016$ ✓	✓ answer/ antwoord (1)	K
3.3.2	$3,6 \div 0,02$ $= \frac{36}{10} \div \frac{2}{100}$ $= \frac{36}{10} \times \frac{100}{2}$ ✓ $= 180$ ✓	✓ method/ metode ✓ answer/ antwoord (2)	RP
3.4	Let x be the total number of items produced/ Laat x die totale aantal items wat geproduseer word, wees $\therefore \frac{2}{5} \times x = 22\,000$ ✓ $x = \frac{22\,000 \times 5}{2}$ $x = \frac{110\,000}{2}$ $x = 55\,000$ ✓ $\frac{15}{100} \times \frac{55\,000}{1}$ $= 8\,250$ ✓	✓equation/ vergelyking ✓ value of x/ waarde van x ✓ answer/ antwoord (3)	PS
			[14]

QUESTION/VRAAG 4			
4.1.1	Pattern/ Patroon 4 = 14 dots/ kolletjies	✓ answer/ antwoord (1)	K
4.1.1	Pattern/ Patroon 5 = 17 dots/ kolletjies	✓ answer/ antwoord (1)	K
4.1.2	Constant difference/ Konstante verskil = 3 $T_1 = 3(1) + 2 = 5$ $T_2 = 3(2) + 2 = 8$ $T_n = 3n + 2$ ✓ $T_{85} = 3(85) + 2$ ✓ $= 257$ ✓	✓ rule/ reël ✓ substitution/ vervanging ✓ answer/ antwoord (3)	CP
4.2	$-1;\ 2;\ -4;\ 8;\ -16$	✓ 8 ✓ -16 (2)	K
4.3	$a: -\frac{1}{4}\left(\frac{8}{1}\right) + 2$ $= -2 + 2$ $= 0$ ✓	✓ answer/ antwoord ✓ answer/ antwoord (2)	RP

	$b: -\frac{1}{4}x + 2 = 3$ $-\frac{1}{4}x = 1$ $x = -4$ ✓		
4.4.1	$y = 4x - 5$ ✓✓	✓ $4x$ ✓ -5 (2)	RP
4.4.2	$p = 4(8) - 5 = 27$ ✓ $q: 4x - 5 = 39$ $4x = 44$ $x = 11$ ✓	✓ value of/ waarde van p ✓ value of/ waarde van q (2)	RP
			[13]
QUESTION/ VRAAG 5			
5.1.1	$-6 + \sqrt{4} \times (4 - 9) - (-5)$ $= -6 + 2 \times (-5) + 5$✓ $= -6 - 10 + 5$ ✓ $= -11$ ✓	✓✓ simplification/ vereenvoudiging ✓ answer/ antwoord (3)	RP
5.1.2	$-3^2 \times \sqrt{9 + 16} + \frac{-3 \times 2^3}{-2 - 6}$ $= -9 \times \sqrt{25} + \frac{-24}{-8}$ $= -9 \times 5 + 3$✓ $= -45 + 3$ ✓ $= -42$ ✓	✓✓ simplification/ vereenvoudiging ✓ answer/ antwoord (3)	RP
5.2.1	$a \times b \times a^2 \times b^3$ $= a^3b^4$✓	✓ answer/ antwoord (1)	K
5.2.2	$\frac{3x^2 \times 4xy^7}{2x^2y \times 6x \times y}$ $= \frac{12x^3y^7}{12x^3y^2}$ ✓ $= y^5$ ✓	✓ simplification/ vereenvoudiging ✓ answer/ antwoord (2)	RP
5.2.3	$\left(\frac{-2x^2y^2}{xy}\right)^3 + (2xy)^0$ $= \frac{-8x^6y^6}{x^3y^3} + 1$ ✓ $= -8x^3y^3 + 1)$ ✓	✓ simplification/ vereenvoudiging ✓ answer/ antwoord (2)	RP
5.3.1	5 ✓	✓ answer/ antwoord (1)	K
5.3.2	$-\frac{1}{3}$ ✓	✓ answer/ antwoord (1)	K
5.4	$4x - 8y - 3z + x - y + z + 3y + 2z$ $= 4x + x - 8y - y + 3y \pm 3z + z + 2z$ $= 5x - 6y$ ✓✓	✓ one mark for each term in answer/ een punt vir elke term in antwoord (2)	RP

5.5	$a + b = 16$ $b + c = 14$ $a + c = 10$ $\therefore 2a + 2b + 2c = 40$ ✓ $a + b + c = 20$ $(a + b + c)^3 = (20)^3$✓ $= 8\,000$ ✓	✓ $2a + 2b + 2c = 40$ ✓ $(a + b + c)^3$ $= (20)^3$ ✓ answer/ antwoord (3)	PS
			[18]