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PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

VHEMBE WEST DISTRICT

Liberty through knowledge

GRADE 9

MATHEMATICS

2023 TERM 1

COMMON TEST MEMORANDUM

MARKS: 50

IMPORTANT INFORMATION:

This is a marking guideline. In any instance where learners have used different but sound mathematical strategies to solve the problems, they (learners) should be credited.

This Memorandum consists of 6 pages including the cover page.

QUESTION 1			
Que	Possible solutions	Mark allocation	Total
1.1	C ✓	1 mark for each correct answer	(1)
1.2	D ✓		(1)
1.3	B ✓		(1)
1.4	A ✓		(1)
1.5	A ✓		(1)
			[5]
QUESTION 2			
2.1	$36 = 2^2 \times 3^2$ ✓ $54 = 2 \times 3^3$ ✓ Or <i>Factors of 36: {1; 2; 3; 4; 6; 9; 12; 18; 36} ✓</i> <i>Factors of 54: {1; 2; 3; 6; 9; 18; 27; 54} ✓</i> Or 24 $\swarrow \searrow$ $2 \quad 18$ $\swarrow \searrow$ $2 \quad 9$ ✓ $\swarrow \searrow$ $3 \quad 3$ 54 $\swarrow \searrow$ $2 \quad 27$ $\swarrow \searrow$ $3 \quad 9$ ✓ $\swarrow \searrow$ $3 \quad 3$ $HCF(36;54) = 18$ ✓	1 mark for answer 2 marks for method	(3)
2.2	$24:36$ $= \frac{24}{12} : \frac{36}{12}$ ✓ $= 2:3$ ✓	1 mark for dividing by the HCF which is 12. 1 mark for answer	(2)
2.3	$speed = \frac{distance}{time}$ ✓ $80km/h = \frac{320km}{time}$ ✓ $time = 4 \text{ hours}$ ✓ OR	1 mark for formula 1 mark for substitution 1 mark for answer	

	$time = \frac{distance}{speed} \checkmark$ $time = \frac{320km}{80km/h} \checkmark$ $time = 4 \text{ hours} \checkmark$		(3)
2.4	$simple \text{ interest} = R100000 \times \frac{20}{100} \times 3 \checkmark$ $= R60000 \checkmark$ $Total \text{ amount owed} = R100000 + R60000$ $= R160000 \checkmark$ OR $A = P \left(1 + \frac{nr}{100} \right) \checkmark$ $A = R100000 \left(1 + \frac{20 \times 3}{100} \right) \checkmark$ $A = R160000 \checkmark$	1 mark for substituting on SI. 1 mark for answer on SI 1 mark for answer Or 1 mark for formula for simple interest 1 mark for substitution 1 mark for answer	(3)
			[11]
QUESTION 3			
3.1			
(a)	2^{-4} $= \frac{1}{2^4} \checkmark$ $= \frac{1}{16} \checkmark$	1 mark for simplifying 1 mark answer	(2)
(b)	$\left(\frac{a^5}{b^6} \right)^3$ $= \frac{a^{15}}{b^{18}} \checkmark$	1 marks for multiplying exponents.	(1)
(c)	$5m^2np \times mn^2p^2 - 3m^3n^3p^3 \times (4mnp)^0$ $= 5m^3n^3p^3 - 3m^3n^3p^3 \times 1 \checkmark\checkmark$ $= 2m^3n^3p^3 \checkmark$	2 marks for simplifying. 1 mark for answers	(3)
(d)	$\frac{32abc}{64ac} \times \frac{8bc}{4b^2}$ $= \frac{8abc}{8ac} \times \frac{bc}{b^2} \checkmark$ $= \frac{8ab^2c^2}{8ab^2c} \checkmark$ $= c \checkmark.$	2 marks for multiplying numerator by numerator and denominator by denominator. 1 mark for answer	(3)

(e)	$\frac{-3a^3 \times (-4b^3) - (-27b^3b^3)}{-3a^2b}$ $= \frac{12a^3a^3 + 27a^3b^3}{-3a^2b} \checkmark$ $= \frac{39a^3b^3}{-3a^2b} \checkmark$ $= -13ab^2 \checkmark$	1 mark for multiplying like terms. 1 mark for adding like terms. 1 mark for answer	(3)
(f)	$-2(15m) - 3(-12m)$ $= -30m + 36m \checkmark$ $= 6m \checkmark$	1 mark for simplifying. 1 mark for answer	(2)
3.2	$= -39^\circ\text{C} - (-98^\circ\text{C})$ $= 59^\circ\text{C} \checkmark$	1 mark for answer	(1)
			[15]
QUESTION 4			
4.1.	$\frac{12a^5b^2}{3a^2b^2}$ $= 4a^{5-2}b^{2-2} \checkmark$ $= 4a^3b^0 \checkmark$ $= 4a^3 \checkmark$	2 dividing coefficients and subtracting powers. 1 mark answer	(3)
4.2.	$(3x^3 \times 2x^3)^2 + (3x^6 + 2x^6)^2$ $= (6x^6)^2 + (5x^6)^2 \checkmark$ $= 36x^{12} + 25x^{12} \checkmark$ $= 61x^{12} \checkmark$	1 mark for solving power which is inside the brackets. 1 mark for removing the brackets. 1 mark for answer	(3)
4.3.	$x^3 \times (x^2)^3$ $= x^3 \times x^6 \checkmark$ $= x^9 \checkmark$	1 mark for applying exponent rule. 1 mark for answer	(2)
			[8]

QUESTION 5

QUESTION 5																																	
5.1	Patter n	1	2	3	4	5	2 marks for answers		(2)																								
	Numb er of sticks	3 ✓	5 ✓	7	9	11																											
5.2	$T_n = (\text{constant difference})(n) + (T_1 - d)$ $T_n = d \times n + (T_1 - d)$ $T_n = 2n + (3 - 2) \checkmark$ $T_n = 2n - 1 \checkmark$ Or <table><tr><td>The position of the term</td><td>T_1</td><td>T_2</td><td>T_3</td><td>T_4</td><td>T_4</td></tr><tr><td>The constant difference by the position of the term</td><td>2(1)</td><td>2(2)</td><td>2(3)</td><td>2(4)</td><td>2(n)</td></tr><tr><td>What to do to get the actual term</td><td>+1</td><td>+1</td><td>+1</td><td>+1</td><td>+1</td></tr><tr><td>The actual term in the sequence</td><td>3</td><td>5</td><td>7</td><td>9</td><td>2(n) + 1</td></tr></table> The n th term is $T_n = 3n + 1 \checkmark \checkmark$						The position of the term	T_1	T_2	T_3	T_4	T_4	The constant difference by the position of the term	2(1)	2(2)	2(3)	2(4)	2(n)	What to do to get the actual term	+1	+1	+1	+1	+1	The actual term in the sequence	3	5	7	9	2(n) + 1			
The position of the term	T_1	T_2	T_3	T_4	T_4																												
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The actual term in the sequence	3	5	7	9	2(n) + 1																												

			(2)
5.3	Constant difference of 2 multiply by the position of the term/term number ✓ and Add 1. ✓ Or There is a constant difference between the terms ✓. Add 2 from the previous term to get the next term. ✓ Or Multiply the constant difference which is 2 ✓ by the position of the term and add 1. ✓ Or Start with 3. Add 2 to 3 to get 5 ✓. Continue adding 2 to each previous term to obtain consecutive terms. ✓	2 marks for answers	(2)
5.4	$T_n = 2n + 1$ $T_{17} = 2(17) + 1$ ✓ $T_{17} = 35$ ✓	1 mark for substituting 1 mark for answer	(2)
5.5	$T_n = 2n + 1$ $201 = 2n + 1$ ✓ $201 - 1 = 5n$ ✓ $n = 100$ ✓ $T_{100} = 201$ 201 is the 100th term in the sequence	1 mark for substituting 1 mark for grouping the like terms. 1 mark for answer	(3)
			[11]
TOTAL:50			