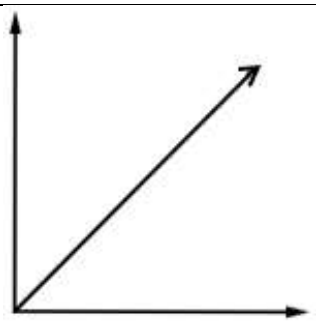
basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

GEC PILOT STUDY
MARKING GUIDELINE 2023
MATHEMATICS PAPER1
GRADE 9

SECTION A

- *One mark per answer.*
- *There are no half marks.*

No.		Expected answer		Clarification
1.	B	Irrational	✓	
2.	B	108	✓	$12 = 2 \times 2 \times 3$ $18 = 2 \times 3 \times 3$ $27 = 3 \times 3 \times 3$ $2 \times 2 \times 3 \times 3 \times 3 = 108$
3.	A	$\frac{2}{3}$	✓	Numerators $8 = 2^3$ $12 = 2^2 \times 3$ HCF$= 2 \times 2 = 4$ Denominators $30 = 2 \times 3 \times 5$ $36 = 2^2 \times 3^2$ HCF $= 2 \times 3 = 6$ HCF $= \frac{4}{6} = \frac{2}{3}$
4.	C		✓	

No.		Expected answer		Clarification
5.	A	103,13 km/h	✓	$s = \frac{d}{t}$ $120 = \frac{d}{2{,}75}$ $d = 120 \times 2{,}75$ $d = 330$ km $s = \frac{330}{3{,}2}$ $s = 103{,}13$ km/h
6.	D	R1 339,42	✓	$A = P(1+i)^n$ $A = R5\,265\left(1 + \frac{12}{100}\right)^2$ $A = R5\,265(1+0{,}12)^2$ $A = R5\,265(1{,}12)^2$ $A = R5\,265(1{,}2544)$ $A = R6\,604{,}42$ $CI = R6\,604{,}42 - R5\,265$ $CI = R1\,339{,}42$
7.	C	$-7 \times (11 \times 4)$	✓	
8.	B	8	✓	$3(4) - 2(2) = 12 - 4$ $= 8$
9.	D	2 and $-\frac{1}{2}$	✓	
10.	C	14	✓	$\frac{2(-3) - (5) - 4(6 \div 8)}{5 - 6}$ $= \frac{-6 - 5 - 4\left(\frac{3}{4}\right)}{-1}$ $= \frac{-14}{-1}$ $= 14$
11.	A	1	✓	$\sqrt{49} - 2^3 + \sqrt[3]{216} \div 3$ $= 7 - 8 + 6 \div 3$ $= 7 - 8 + 2$ $= 1$
12.	C	$\frac{1}{5}$	✓	$\sqrt{\frac{\sqrt[3]{-64} + 5}{4^2 + 3^2}} = \sqrt{\frac{-4 + 5}{16 + 9}}$ $= \sqrt{\frac{1}{25}}$ $= \frac{1}{5}$
13.	A	a^5c	✓	$a^3 \times a^2c$ $= a^5c$

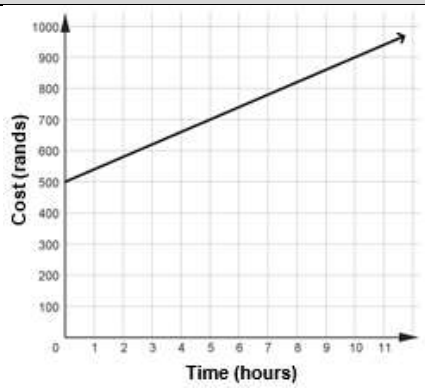
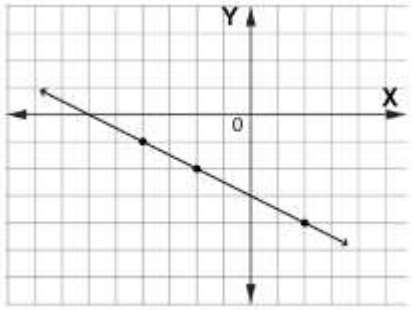
No.		Expected answer		Clarification
14.	C	2^{x+2}	✓	$\frac{4^{x+1}}{2^x}$ $= \frac{(2^2)^{x+1}}{2^x}$ $= \frac{2^{2x+2}}{2^x}$ $= 2^{2x+2-x}$ $= 2^{x+2}$
15.	B	$\frac{b+a}{ab}$	✓	$a^{-1} + b^{-1}$ $= \frac{1}{a} + \frac{1}{b}$ $= \frac{b+a}{ab}$
16.	B	1	✓	$(2^2)^3 \times (2^3)^{-2}$ $= 2^6 \times 2^{-6}$ $= 2^0$ $= 1$
17.	A	$-\frac{8x^3}{y^3}$	✓	$\left(\frac{x^{-3}y}{-2x^{-2}}\right)^{-3}$ $= \left(\frac{-2x^{-2}}{x^{-3}y}\right)^3$ $= \left(\frac{-2x^3}{x^2y}\right)^3$ $= \left(-\frac{2x}{y}\right)^3$ $= -\frac{8x^3}{y^3}$
18.	D	$\frac{7}{y}$	✓	$\frac{3(x+y)^0}{y} + 5y^{-1} - \frac{(x^{-1}y)^3}{x^{-3}y^4}$ $= \frac{3 \times 1}{y} + 5 \times \frac{1}{y} - \frac{x^{-3}y^3}{x^{-3}y^4}$ $= \frac{3}{y} + \frac{5}{y} - \frac{1}{y}$ $= \frac{7}{y}$
19.	B	35	✓	$3 + 5\ ;\ 8 + 7\ ;\ 15 + 9\ ;\ 24 + 11\ = 35$ **OR** Perfect squares -1 $2^2 - 1 = 3$ $3^2 - 1 = 8$ $4^2 - 1 = 15$
20.	C	83	✓	$3 + 6 + 10 + 15 + 21 + 28 = 83$

No.		Expected answer		Clarification
21.	A	A constant ratio of three was used.	✓	
22.	C	$T_n = -2n + 7$	✓	1; 3; 5; 7; … are not consecutive term positions $5;\ a;\ 1;\ b;\ -3;\ c;$ … $a - 5 = 1 - a$ $2a = 6$ $\frac{2a}{2} = \frac{6}{2}$ $a = 3$ 5; 3; 1; … are consecutive terms $3 - 5 = 1 - 3$ $d = -2$ $T_1 = -2(1) + \_\_ = 5$ $T_2 = -2(2) + \_\_ = 3$ $T_3 = -2(3) + \_\_ = 1$ $T_n = -2n + 7$
23.	A	$3x^3$ and $3x(x^2)$	✓	
24.	D	-8 and 6^{th}	✓	$(-2x^2)^3$ $= (-2)^3(x^2)^3$ $= -8x^6$ Coefficient is -8 and degree is 6^{th}
25.	C	$x + 3x^2 + 2 - 4x$	✓	
26.	A	$-4x^3 - 2x^2 + x$	✓	$-x(4x^2 + 2x - 1)$ $= -4x^3 - 2x^2 + x$
27.	A	$3x^2 - 10x + 1$	✓	$3x(x-4) + \frac{4x+2}{2}$ $= 3x(x-4) + \frac{4x}{2} + \frac{2}{2}$ $= 3x^2 - 12x + 2x + 1$ $= 3x^2 - 10x + 1$ **OR** $= \frac{2 \times 3x(x-4) + 4x + 2}{2}$ $= \frac{6x^2 - 24x + 4x + 2}{2}$ $= \frac{6x^2}{2} - \frac{20x}{2} + \frac{2}{2}$ $= 3x^2 - 10x + 1$

No.		Expected answer		Clarification
28.	A	$\frac{x}{2}$	✓	$\sqrt[3]{0{,}125x^3}$ $=\sqrt[3]{\frac{1}{8}x^3}$ $=\sqrt[3]{\frac{1}{2^3}x^3}$ $=\left(\frac{1}{2^3}x^3\right)^{\frac{1}{3}}$ $=\left(\frac{1}{2^3}\right)^{\frac{1}{3}}(x^3)^{\frac{1}{3}}$ $=\frac{1}{2}x$ $=\frac{x}{2}$
29.	C	$2x^2+\frac{17x}{3}-1$	✓	$(x+3)(2x-\frac{1}{3})$ $=2x^2-\frac{x}{3}+6x-\frac{3}{3}$ $=2x^2-\frac{x+18x}{3}-1$ $=2x^2+\frac{17x}{3}-1$
30.	D	16	✓	$-8\left(-\frac{1}{2}\right)^2+10(2)-2$ $=-8\left(\frac{1}{4}\right)+20-2$ $=-2+20-2$ $=16$
31.	A	$(2x-3)(2x+3)$	✓	
32.	B	$(x-8)(x+3)$	✓	
33.	A	$6(y-3)(y+1)$	✓	
34.	B	$x+2$	✓	$\frac{2x^2-2x-12}{2x-6}$ $=\frac{2(x^2-x-6)}{2(x-3)}$ $=\frac{2(x+2)(x-3)}{2(x-3)}$ $=x+2$

No.		Expected answer		Clarification
35.	A	$x+y+1$	✓	$\frac{(x+y)^2-1}{x+y-1}$ $=\frac{(x+y-1)(x+y+1)}{x+y-1}$ $=x+y+1$
36.	A	2	✓	
37.	B	2	✓	$\frac{2p}{2}=\frac{4}{2}$ $p=2$
38.	D	$x=0$ or $x=1$	✓	
39.	D	$b=3$ or $b=-2$	✓	
40.	B	$2x-8=18$	✓	
41.	C	4	✓	$y=16-12$ $y=4$
42.	C	-2	✓	$3^m=9^{-1}$ $3^m=(3^2)^{-1}$ $3^m=3^{-2}$ $m=-2$
43.	D	$p=17$ and $t=6$	✓	$y=x^2+1$ $p=(-4)^2+1$ $p=16+1$ $p=17$ and $y=x^2+1$ $37=t^2+1$ $t^2=36$ $t=\pm 6$ $\therefore t=6$
44.	D	$x=-6$ or $x=1$	✓	$x^2+3x+2x-6=0$ $x^2+5x-6=0$ $(x+6)(x-1)=0$ $x=-6$ or $x=1$

No.		Expected answer		Clarification
45.	B	$a = 0$ or $a = 4$	✓	$\left(\frac{1}{2}a - 1\right)\left(\frac{1}{2}a - 1\right) = 1$ $\frac{1}{4}a^2 - a + 1 = 1$ $\frac{1}{4}a^2 - a = 0$ $a^2 - 4a = 0$ $a(a - 4) = 0$ $a = 0$ or $a - 4 = 0$ $a = 0$ or $a = 4$ **OR** $\frac{1}{2}a - 1 = \pm 1$ $\frac{1}{2}a - 1 = 1$ or $\frac{1}{2}a - 1 = -1$ $\frac{1}{2}a = 2$ or $\frac{1}{2}a = 0$ $a = 4$ or $a = 0$
46.	B	2 m	✓	$A = (x - 18)(x)$ $40 = x^2 - 18x$ $0 = x^2 - 18x - 40$ $0 = (x - 20)(x + 2)$ $x = 20$ or $x = -2$ $\therefore x = 20$ breadth $= 20 - 18$ breadth $= 2$ m
47.	A	$b = 33$	✓	$y = 4x - 3$ $b = 4(9) - 3$ $b = 33$
48.	C	$\boldsymbol{x}$ | -2 | 0 | 2 $\boldsymbol{y}$ | -8 | -2 | 4	✓	
49.	B	$m = (n + 1)^2$	✓	$m = (Even + 1)^2$ $m = (Odd)^2$ $m = Odd$
50.	D	$y = -\frac{1}{2}x + 1$	✓	$m = -\frac{1}{2}$ y-intercept at $(0; 1)$ and $c = 1$ $y = -\frac{1}{2}x + 1$
51.	D	$V = 4t + 6$	✓	Common difference $= 4$ $V = 4t + c$ By inspection: $V = 4t + 6$

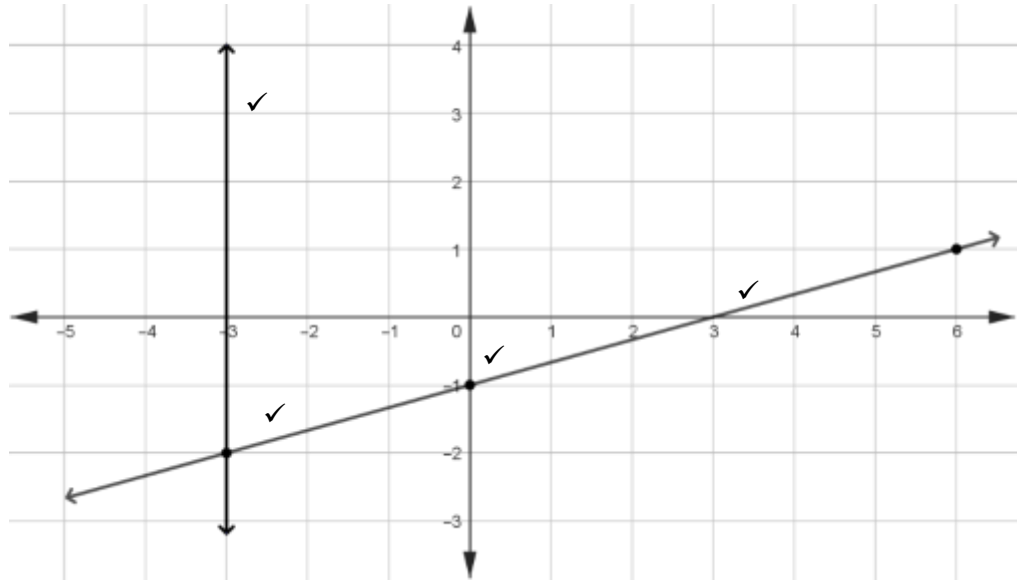
No.		Expected answer		Clarification
52.	A		✓	$c = 40t + 500$ y-intercept = R500 and the gradient = 40
53.	B	$(0; -5)$	✓	
54.	D	1	✓	$y = 2x - 2$ $2x - 2 = 0$ $2x = 2$ $x = 1$
55.	C	$-\frac{3}{4}$	✓	
56.	B		✓	$\boldsymbol{x}$: -4, -2, 2 $\boldsymbol{y}$: -1, -2, -4
57.	C	$\boldsymbol{x}$: 1, 2, 3, 4 $\boldsymbol{y}$: 12, 20, 28, 36	✓	Constant difference of 8
58.	D	$-2x + y - 2 = 0$	✓	$-2x + y - 2 = 0$ $y = 2x + 2$
59.	B	$(-1; -3)$	✓	$y = 2x - 1$ $-3 = 2(-1) - 1$ $-3 = -3$
60.	A	$y = -3x + 5$	✓	$m_{AB} = m_{CD}$ …Parallel lines $y = -3x + c$ $\therefore 2 = -3(1) + c$ $c = 5$
			Section A total	**60**

SECTION B

- Do not penalise the learner for the same mistake twice.
- *There are no half marks.*

MARKING CODES	
M	Method mark
A	Accuracy mark
CA	Consistent Accuracy mark

No.	Expected answer	Clarification	Mark
61.	$y = 3x - 5$ ✓**M** $46 = 3q - 5$ ✓**M** $q = \frac{51}{3}$ $q = 17$ ✓**CA**	General term: 1 mark Substitution: 1 mark Answer: 1 mark Accept $x = 17$ Answer only full marks	3
62.	$\frac{-5y^3(6y-1) - 3y^2(5-10y^2)}{5y^2}$ $= \frac{-30y^4 + 5y^3 - 15y^2 + 30y^4}{5y^2}$ ✓**M** $= \frac{5y^3 - 15y^2}{5y^2}$ $= \frac{5y^2(y-3)}{5y^2}$ ✓**M** $= y - 3$ ✓**CA** **OR** $\frac{y^2(6y-1)}{-y} - \frac{3y^2(5-10y^2)}{5y^2}$ $= \frac{6y^3 - y^2}{-y} - \frac{15y^2 - 30y^4}{5y^2}$ ✓**M** $= \frac{6y^3}{-y} - \frac{y^2}{-y} - \frac{15y^2}{5y^2} + \frac{30y^4}{5y^2}$ $= -6y^2 + y - 3 + 6y^2$ ✓**M** $= y - 3$ ✓**CA**	Simplification:1 mark $\frac{5y^2(y-3)}{5y^2}$:1 mark Answer:1 mark Simplification:1 mark $-6y^2 + y - 3 + 6y^2$:1 mark Answer:1 mark	3

No.	Expected answer	Clarification	Mark
63.	Let x be the mass of the car $900 + 120 + \frac{x}{5} = x$ ✓**M** $4500 + 600 + x = 5x$ ✓**M** $4x = 5100$ $x = 1275$ kg ✓**CA** ∴ The car's engine $= \frac{x}{5}$ $= 255$ kg ✓**CA** **OR** Let x be the mass of the car $900 + 120 + \frac{x}{5} = x$ ✓**M** $900 + 120 = \frac{4}{5}x$ ✓**M** $4x = 5100$ $x = 1275$ kg ✓**CA** ∴ The car's engine $= \frac{x}{5}$ $= 255$ kg ✓**CA**	Equation: 1 mark Simplification: 1 mark $x = 1275$ kg: 1 mark Answer: 1 mark Equation: 1 mark Simplification: 1 mark $x = 1275$ kg: 1 mark Answer: 1 mark	4
64.			
64.1	On graph ✓✓✓**A**	Correct plotting of any 2 points:1 mark Correct y-intercept:1 mark Shape of graph: 1 mark	(3)
64.2	On graph ✓**A**	Correct drawing of graph: 1 mark	(1)

No.	Expected answer	Clarification	Mark
64.3	Distance between x- intercepts $= 6$ units ✓**CA**	Answer: 1 mark	(1)
		Section B total	**15**