GRADE 9 PAPER 1 (November 2024) MEMORANDUM

QSTN	Possible Soln.	Mark Descriptor	Level
1.1.1	$0\ ;\ \frac{27}{9}$	✓ correct values	K (1)
1.1.2	$\pi\ ;\ \sqrt{13}$	✓ correct values	K (1)
1.2.1	Indirect/Inverse Proportion	✓ correct ans.	K (1)
1.2.2	$y=\frac{8}{x}$	✓ correct equation	K (1)
1.2.3	$b=\frac{8}{1/2}$ $a=\frac{8}{8}$ $=8\times 2$ $a=1$ $b=16$	✓ ans. for a ✓ ans. for b	R (2)
1.3	$S=\frac{D}{T}$ $240\,km/h=5\,hrs$ $D=S\times T$ $x\ \ km/h=1\frac{2}{3}\,hrs$ $D=240\times 5$ $x=240\times 5\div\frac{5}{3}$ $D=1200\,km$ *OR* $x=720\ km/h$ $S=\frac{1200}{1\frac{2}{3}}$ $=720\,km/h$	✓ distance ✓ divide by $1\frac{2}{3}$ ✓ ans. for speed	C (3)
TOTAL Q1 [9]			

QSTN	Possible Soln.	Mark Descriptor	Level
2.1	$5^0\cdot 3^{-2}+3^2$ $=\frac{1}{3^2}+9$ $=\frac{1}{9}+9$ $=\frac{1+81}{9}$ $=\frac{82}{9}$	✓ $\frac{1}{9}$ ✓ $\frac{82}{9}$	R (2)

2.2	$\frac{x^2 \times x^{-3} \times 16y^{-1}}{2x^3 y}$ $= \frac{8x^{-1}y^{-1}}{x^3 y}$ $= 8x^{-4}y^{-2}$ $= \frac{8}{x^4 y^2}$	✓ $8x^{-1}$ ✓ $x^{-4}y^{-2}$ ✓ $\frac{8}{x^4y^2}$ (ans.)	R (3)
2.3	$\frac{4(a^2b)^{-3}}{a^{-4}bc^2}$ $= \frac{4a^{-6}b^{-3}}{a^{-4}bc^2}$ $= \frac{4a^{-2}b^{-4}}{c^2}$ $= \frac{4}{a^2b^4c^2}$	✓ $a^{-6}b^{-3}$ ✓ $a^{-2}b^{-4}$ ✓ $\frac{4}{a^2b^4c^2}$	R (3)
TOTAL Q2 [8]			

QSTN	**Possible Soln.**	**Mark Descriptor**	**Level**
3.1	$(x+4)(2x-3)$ $= 2x^2 - 3x + 8x - 12$ $= 2x^2 + 5x - 12$	✓ $2x^2$ ✓ $5x$ ✓ 12	R (3)
3.2	$3 + 4(2x-5)^2$ $= 3 + 4(4x^2 - 20x + 25)$ $= 3 + 16x^2 - 80x + 100$ $= 16x^2 - 80x + 103$	✓ bracket ✓ distrib ✓ ans.	R (3)
3.3	$\frac{3x^2y}{2} \div \frac{6x^3}{8y} \times \frac{x^3}{y^4}$ $= \frac{3x^2y}{2} \div \frac{6x^6}{8y^5}$ $= \frac{3x^2y}{2} \times \frac{8y^5}{6x^6}$ $= \frac{24x^2y^6}{12x^6}$ *OR* $\frac{x^2y}{1} \times \frac{2y^5}{x^6}$ $= \frac{2y^6}{x^4}$	✓ $\frac{6x^6}{8y^5}$ ✓ tip & times ✓ num (ans) ✓ denom (ans)	C (4)
TOTAL Q3 [10]			

QSTN	Possible Soln.	Mark Descriptor	Level
4.1	$16y^2 - 64$ $= 16\left(y^2 - 4\right)$ $= 16\left(y + 2\right)\left(y + 2\right)$	✓ HCF ✓ DOTS	R (2)
4.2	$x^2 + 9x + 18$ $= \left(x + 6\right)\left(x + 3\right)$	✓ fact. 1: $x + 6$ ✓ fact. 2: $x + 3$	R (2)
4.2	$2\left(x - 3y\right) - x\left(3y - x\right)$ $= 2\left(x - 3y\right) + x\left(x - 3y\right)$ *OR* $= -2\left(3y - x\right) - x\left(3y - x\right)$ $= \left(x - 3y\right)\left(2 + x\right)$ $= -\left(3y - x\right)\left(2 + x\right)$	✓ switch & change ✓ common bracket ✓ $2 + x$ ***OR*** $-(2 + x)$	C (3)
TOTAL Q4 [7]			

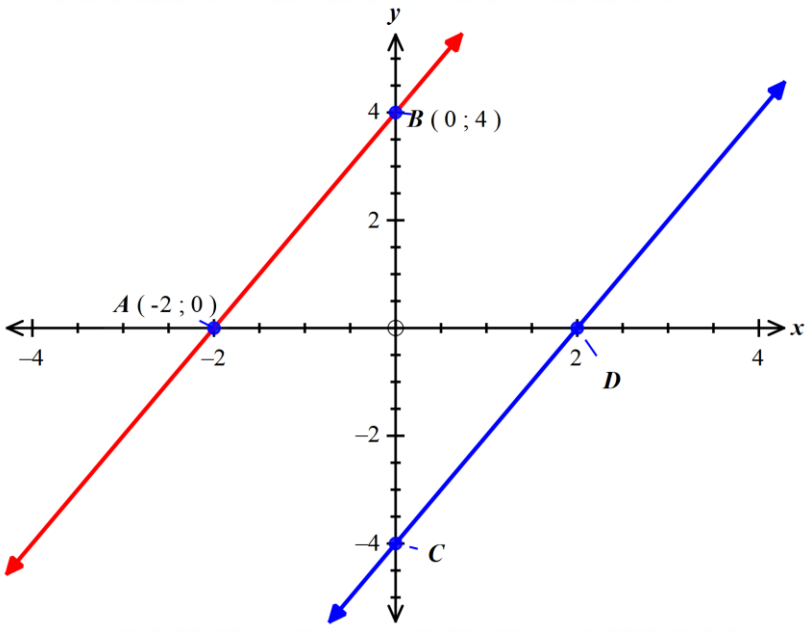
QSTN	Possible Soln.	Mark Descriptor	Level
5.1	$6x + 4 = 2x - 4$ $4x = -8$ $x = -2$	✓ $4x = -8$ ✓ ans.	R (2)
5.2	$x^2 - 5x = -6$ $x^2 - 5x + 6 = 0$ $\left(x - 3\right)\left(x - 2\right) = 0$	✓ SF ✓ fact 1: $x - 3$ ✓ fact 2: $x - 2$	R (3)
5.3	$\frac{2x-1}{5} = \frac{2}{1} - \frac{x-1}{3}$ $LCD = \times 15$ $3\left(2x - 1\right) = 30 - 5\left(x - 1\right)$ $6x - 3 = 30 - 5x + 5$ $6x - 3 = -5x + 35$ $11x = 38$ $x = \frac{38}{11}$	✓ multiply LCD ✓ distrib brackets ✓ simplify ✓ ans.	R (4)
5.4	$3^{x-1} = 81$ $3^{x-1} = 3^4$ $x - 1 = 4$ $x = 5$	✓ prime fact 81 ✓ equate exp. ✓ ans.	R (3)

5.5	*Let* $x = \#correct\ answers$ $\therefore 30 - x = \#incorrect\ answers$ $x - 2(30 - x) = 21$ $x - 60 + 2x = 21$ $3x = 81$ $x = 27$ *correct answers*	✓ set up correct eq. ✓ $-2(30 - x)$ ✓ simplify ✓ correct ans.	PS (4)
TOTAL Q5 [16]			

QSTN	**Possible Soln.**	**Mark Descriptor**	**Level**
6.1	17 candles	✓ ans.	K (1)
6.2	$T_n = 4n + 1$	✓ $4n$ ✓ $+1$	R (2)
6.3	$T_n = 4n + 1$ $37 = 4n + 1$ $n = \frac{37 - 1}{4}$ $n = 9 \quad (\therefore Step\ 9)$	✓ $T_n = 37$ ***OR*** reverse operations ✓ correct ans. **[✓✓ AO]**	R (2)
TOTAL Q6 [5]			

QSTN	**Possible Soln.**	**Mark Descriptor**	**Level**
7.1	*Amount to borrow* $= R30\ 000$ $[less\ deposit]$ $A = P(1 + i \times n)$ $A = 30000(1 + 0,08 \times 3)$ $P = R37\ 200 \quad [to\ give\ back\ to\ Dad]$	✓ $P = 30\ 000$ ✓ subst. formula ✓ ans.	R (3)
7.2	$A = P(1 + i)^n$ $n = 5$ *years* $[2029\ not\ included]$ $35\ 000 = P(1 + 0,12)^5$ $35\ 000 = P(1,12)^5$ $P = \frac{35\ 000}{(1,12)^5}$ $P = R19\ 859,94 \quad [to\ invest]$	✓ $n = 5\ years$ ✓ subst. formula ✓ ans.	C (3)

7.3.1	$A = P(1+i\times n)$ $A = 543,96\times 36 = 19\ 582,56$ $P = 15\ 999 - 1600 = 14\ 399$ $n = 3\ years$ $i = ?$ $19\ 582,56 = 14\ 399(1+i\times 3)$ $\frac{19\ 582,56}{14\ 399} = 1+3i$ *OR* $1,359994444... = 1+3i$ $3i = \frac{19\ 582,56}{14\ 399} - 1$ *OR* $0,3599944441...$ $i = \frac{\frac{19\ 582,56}{14\ 399} - 1}{3}$ $i = 0,119998148...\times 100$ $i = 12\%$ $[\therefore claim\ is\ valid]$	✓ $A = 19\ 582,56$ ✓ $P = 14\ 399$ ✓ subst. SI formula ✓ simplify ✓ ans. with concl.	PS (5)
TOTAL Q7 [11]			

QSTN	**Possible Soln.**	**Mark Descriptor**	**Level**
8.1.1	x – intercept: make $y = 0$ $0 = 2x + 4$ $2x = -4$ $x = -2$ $(-2;0)$ y – intercept: $y = 2(0) + 4$ $y = 4$ $(0;4)$	✓ $x - int$ ✓ $y - int$ ✓ graph/line ✓ labels	R (4)
			

8.1.2	Length of AD: $AD = D_x - A_x$ $AD = 2-(-2)$ $AD = 4$ *units*	✓ right x – left x ✓ ans. ***OR*** ✓✓ AO	R (2)
8.1.3	Calculate E_y: substitute $x = -4$ into $y = 2x + 4$ $a = 2(-4) + 4$ $a = -4$	✓ subst. E coord. ✓✓ ans.	R (3)
TOTAL Q8 [9]			

KNOWLEDGE : 7%

ROUTINE PROCEDURES : 64%

COMPLEX PROCEDURES : 17%

PROBLEM SOLVING : 12%