Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2014

MATHEMATICS MEMORANDUM

MARKS: **100**

Important information.

- This is marking guideline. In instances where learners have used different Mathematically sound strategies to solve the problems, they (learners) should be credited.
- Underline errors committed by learners and apply Consistent Accuracy (CA) marking.

Symbol	Explanation
M	Method mark
CA	Consistent Accuracy mark
A	Accuracy mark

This memorandum consist of 9 pages.

Ques.	Solution	Mark Allocation	Total
QUESTION 1			
1.1	C	Give 1 mark for each correct answer.	
1.2	D		
1.3	B		
1.4	C		
1.5	B		
1.6	D		
1.7	B		
1.8	B		
1.9	C		
1.10	C		
			[10]
QUESTION 2			
2.1	13 ✓A	13: 1 mark	(1)
2.2	$T_n = 3n + 1$ ✓✓A **OR** $T_n = 4 + 3(n-1)$ ✓✓A	$3n$: 1 mark $+1$: 1 mark 4: 1 mark $3(n-1)$: 1 mark	(2)
2.3	$T_{20} = 3(20) + 1$ $= 61$ ✓CA **OR** $T_{20} = 4 + 3(20-1)$ $= 61$ ✓ CA	Answer: 1 mark	(1)
			[4]
QUESTION 3			
3.1	$(5^x)^0$ $= 1$ ✓A	1: 1 mark	(1)
3.2	$\frac{x}{2} - \frac{y}{3} + 1$ $= \frac{3x-2y}{6} + \frac{6}{6}$ ✓ M $= \frac{3x-2y+1}{6}$ ✓A	Same denominator: 1 mark $3x - 2y + 1$: 1 mark	(2)

3.3	$-(3x-2)^2+4x$ $=-(9x^2-6x+4)+4x$ ✓ M $=-9x^2+6x-4+4x$ ✓ M $=9x^2+10x-4$ ✓ CA	$9x^2-6x+4$: 1 mark $-9x^2+6x-4$: 1 mark $-9x^2+10x-4$: 1 mark	(3)
			[6]
QUESTION 4			
4.1	$x^2-8x+15$ $=(x-3)$✓$(x-5)$ ✓A	$(x-3)$: 1 mark $(x-5)$: 1 mark	(2)
4.2	$\frac{1}{2}x^2-8$ $=\frac{x^2-16}{2}$ ✓A $=\frac{(x-4)(x+4)}{2}$ ✓A	$\frac{x^2-16}{2}$: 1 mark $\frac{(x-4)(x+4)}{2}$: 1 mark	(2)
4.3	$x^2+3x+tx+3t$ $=x(x+3)+t(x+3)$ ✓ M $=(x+3)$ ✓$(x+t)$ ✓A	Grouping: 1 mark $(x+3)$: 1 mark $(x+t)$: 1 mark	(3)
			[7]
QUESTION 5			
5.1	$3x+4=10$ $\frac{3x}{3}=\frac{10-4}{3}$ ✓ M $x=2$ ✓ A	Calculation: 1 mark Answer: 1 mark	(2)
5.2	$\frac{x}{3}+\frac{x+5}{2}=0$ $6(\frac{2x+3x+15}{6})=0\times 6$ ✓ M $5x+15=0$ ✓ M $5x=-15$ $x=-3$ ✓CA	Multiply LHS and RHS by 6 Simplification: 1 mark Answer: 1 mark	(3)
5.3	$x^3=125$ $x^3=5^3$ ✓M $x=5$ ✓A **OR** $x^3=125$ $x=\sqrt[3]{125}$ ✓M $x=5$ ✓A	Calculation: 1 mark Answer: 1 mark	(2)
			[7]

QUESTION 6			
6.1	$1{,}7 \times 10^{13}$ ✓A	Answer: 1 mark	(1)
6.2	$90\ km/h = \frac{7}{2}\ h$ $\therefore x\ km/h = 3\ h$ $3 \times x\ km/h$ ✓ $= 90 \times \frac{7}{2}$ ✓M Average speed $= 105\ km/h$ ✓A	$3 \times x\ km/h$: 1 mark $90 \times \frac{7}{2}$: 1 mark Answer: 1 mark	(3)
6.3	S.I. $= \frac{P.n.r}{100}$ ✓M $= \frac{R4\,400 \times 4 \times 7}{100}$ ✓M $= R1\,232.00$ ✓CA **OR** $SI = Pni$ ✓M $= 4\,400 \times 7 \times 0{,}04$ ✓M $= R\ 1\,232{,}00$ ✓CA	Formula: 1 mark Substitution: 1 mark Answer: 1 mark	(3)
6.4	A = $P(1 + \frac{r}{100})^n$ $= 5\,600P(1 + \frac{7}{100})^4$ ✓M = R7 340,46 ✓CA **OR** A = $P(1 + i)^n$ $= 5\,600(1 + 0{,}07)^4$ ✓M = R7 340,46 ✓CA	Substitution: 1 mark Answer: 1 mark	(2)
6.5	now 6yrs ago Son is x $x - 6$ Father 3 x $3x - 6$ $3x - 6 = 5(x - 6)$ ✓M $2x = 24$ ✓M $x = 12$ Son = 12 years ✓A Father = 36 years ✓CA	Correct statement: 1 mark Calculation: 1 mark 12 years: 1 mark 36 years: 1 mark	(4)
			[13]

QUESTION 7

7.1

$X\left(-1;4\right)\quad Y(0;5)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ ✓M

$m = \frac{5-4}{0+1}$

$= 1$ ✓M

y-intercept $= 5$

$y = mx + 5$

$= x + 5$ ✓A

Calculation: 1 mark

m = 1: 1 mark

Answer: 1 mark

OR

$Y(0;5)\quad Z(1;6)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ ✓M

$m = \frac{6-5}{1-0}$

$= 1$ ✓M

$y-$ intercept $= 5$

$y = mx + 5$

$= x + 5$ ✓A

OR

$X\left(-1;4\right)\quad Z(1;6)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ ✓M

$m = \frac{6-4}{1-(-1)}$

$= \frac{2}{2}$

$= 1$ ✓M

y-intercept $= 5$

$y = mx + 5$

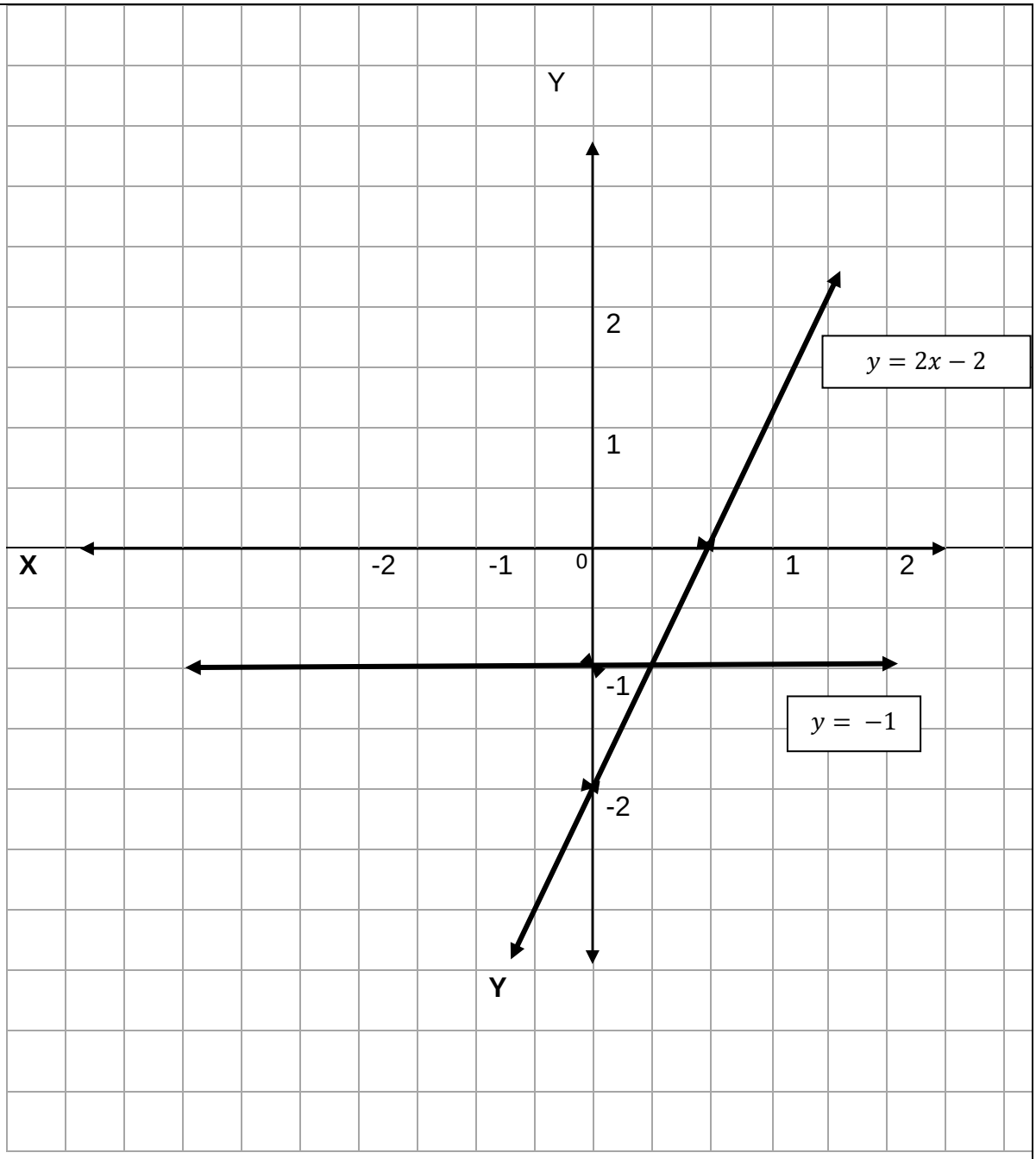
$= x + 5$ ✓A

(3)

7.2

x	-2	-1	0	1	2
$y = 2x - 1$	-6	-4	-2	0	2
$y = -1$	-1	-1	-1	-1	-1

7.2



x-intercept : 1 mark ✓

y-intercept : 1 mark per graph ✓ + ✓

Labelling graph ✓ + ✓

(5)

[8]

QUESTION 8				
8.1	8.1.1	$\widehat{SRT} = \hat{Q} = x + 70°$ (corr. $\angle s$, *RT//QP*) ✓A $\hat{S} + T\hat{R}S + \hat{P} = 180°$ (sum of f $\angle s$ of Δ) ✓A $x + 10° + 28° + 70° = 180°$ $2x + 108° = 180°$ $2x = 72°$ ✓A $x = 36°$ ✓A	Correct statement with reason: 1 mark Correct statement with reason: 1 mark Simplification: 1 mark Answer: 1 mark	(4)
	8.1.2	$S\hat{T}R = \hat{P} = x + 10°$ ✓A (corr. $\angle s$, *RT//QP*) ✓ A $S\hat{T}R = 36° + 10°$ $= 46°$ ✓A	Correct statement: 1 mark Correct statement: 1 mark Answer: 1 mark	(3)
	8.1.3	$\widehat{SRT} = \hat{Q} = x + 70°$ (corr. $\angle s$, *RT//QP*) $x + 70° = 36° + 70°$ ✓A $= 106°$ $106° \neq 90°$ ∴ PQS is not a right angled triangle ✓A	Correct statement: 1 mark Substitution: 1 mark Answer: 1 mark	(3)
8.2	8.2.1	$In \quad \Delta ABC \; and \; \Delta TSP$ $\hat{B} = \hat{P} = 70°$ (given) ✓ $\hat{C} = \hat{S} = 70°$ (base $\angle s$ of is os. Δ) ✓A $\hat{A} = \hat{T} = 40°$ (sum of $\angle s$ of Δ) ✓A ∴ $\Delta ABC /// \Delta TSP$ ($\angle\angle\angle$) ✓A	Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct statement with reason: 1 mark	(4)
	8.2.2	$y = AC = 15$ (given) ✓A $\frac{PS}{BC} = \frac{TS}{AB} = \frac{PT}{AC}$ (Sides are proportional)✓A $\frac{x}{12} = \frac{5 \times 12}{15}$ ∴ $x = 4$ units ✓A	Correct statement with reason: 1 mark Correct statement with reason: 1 mark Answer: 1 mark	(3)
8.3	8.3.1	In $\Delta ABC \; and \; \Delta DCB$ 1. $\hat{A} = \hat{D}$ (given) ✓A 2. $A\hat{C}B = D\hat{B}C$ (given) ✓A 3. $BC = BC$ (Common) ✓A 4. $\Delta ABC \equiv \Delta DCB$ ($\angle\angle S$) ✓A	Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct statement with reason: 1 mark Correct statement with reason: 1 mark	(4)

	8.3.2	$AB = DC$ (From congruency) ✓A $\therefore BC = 4$ units ✓A	Correct statement with reason: 1 mark Answer: 1 mark	(2)
				[23]
QUESTION 9				
9.1	$P'(-4;-1)$ ✓A $Q'(-1;3)$ ✓A $R'(4;1)$ ✓A		Answer: 1 mark Answer: 1 mark Answer: 1 mark	(3)
9.2	Translation ✓A		Answer: 1 mark	(1)
				[4]
QUESTION 10				
10.1	$V = \pi r^2 h$ ✓M = $(3{,}14 \times 7^2)\ cm^2 \times 20)\ cm^1$ ✓M $= 3{,}14 \times 49\ cm^2 \times 20\ cm$ = 3077,2 cm^3 ✓A		Formula: 1 mark Substitution: 1 mark Answer: 1 mark	(3)
10.2	In ΔDBC $DB^2 = 64 + 34\ cm^2$ (Pythagoras) ✓ M =100 cm^2 $= 10\ cm$ ✓ A In ΔABD : $AD^2 = (26^2 - 10^2)\ cm^2$ (Pythagoras) ✓ M = $(676 - 100)\ cm^2$ = 576 cm^2 $\therefore AD = 24\ cm$ ✓ A		Correct statement with reason: 1 mark $10cm$: 1 mark Correct statement with reason: 1 mark Answer: 1 mark	(4)
10.3	$V = 30\ cm^3$ (given) Volume when all dimensions are doubled: $V = 10\ cm \times 6\ cm \times 4\ cm$ ✓ M $= \frac{240}{30} cm^3$ = 8 8 times ✓ A		Calculation: 1 mark 8 times: 1 mark	(2)
				[9]

QUESTION 11

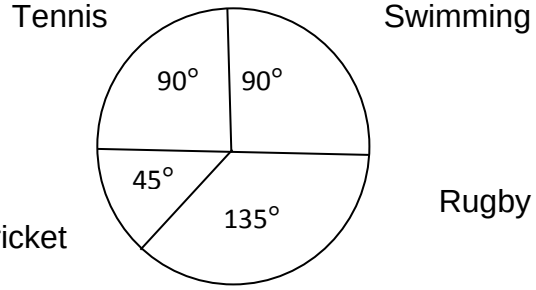
11.1

Tennis $= \frac{12}{48} \times 360° = 90°$ ✓M

Rugby $= \frac{18}{48} \times 360° = 135°$

Cricket $= \frac{6}{48} \times 360° = 45°$ ✓M

Swimming $= \frac{12}{48} \times 360° = 90°$



Pie chart showing learners participating in different extra-mural activities ✓A

✓A

Calculation for any two: 1 mark

Calculation for any two: 1 mark

Pie chart: 1 mark

Label: 1 mark (4)

11.2

Range = 145 – 116

= 29 ✓A

Answer: 1 mark (1)

11.3

11.3.1

		Second toss	
		Head	Tail
First toss	Head	H ; H	H ; T
	Tail	T ; H	T ; T

✓ ✓A

Answer: 1 mark

Answer: 1 mark (2)

11.3.2

n(S) = 4 ✓A

Answer: 1 mark (1)

11.3.3

P (at least T) $= \frac{3}{4}$ ✓A

Answer: 1 mark (1)

[9]

TOTAL: 100