Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2013

MATHEMATICS
MEMORANDUM

MARKS: **100**

This marking guideline consists of 12 pages.

QUESTION 1		
1.1	D √	(1)
1.2	D √	(1)
1.3	B √	(1)
1.4	D √	(1)
1.5	C √	(1)
1.6	D √	(1)
1.7	D √	(1)
1.8	C √	(1)
1.9	D √	(1)
1.10	C √	(1)
		[10]

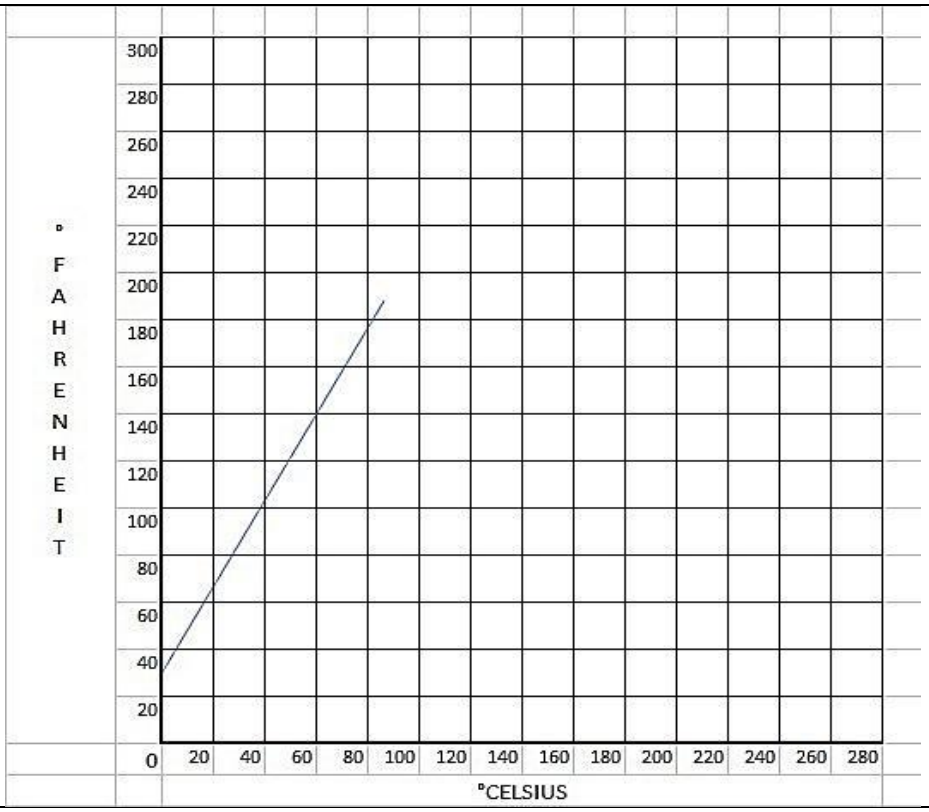
QUESTION 2

2.1	2.1.1	Initial Price (Value for the first year) of a car = R315 000,00 Depreciation@ 7% $= \frac{7}{100}$ x 315 000 = R22 050,00 Value of car for the second year = R292 950,00 √ Depreciation @ 7% = $\frac{7}{100}$ x 292 000 = R20 506,50 Value of car for the third year = R272 443,50 √ Depreciation @ 7% = $\frac{7}{100}$ x 272 443,50 = R19 071,05 Value of car at end of third year = R253 372,45 √	(3)	1 mark for the value for second year 1 mark for the value for the third year 1 mark for Answer
	2.1.2	$SI = \frac{P.r.t}{100}$ $r = \frac{I.100}{P.t} = \frac{39\ 500 \times 100}{315\ 000 \times 3}$ √ $= \frac{3950\ 000}{945\ 000}$ ∴ r = 4,18 % √	(3)	1 mark for the formula 1 mark for correct substitution 1 mark for answer

2.2	No. of pupils = 720 Ratio of senior pupils to junior pupils = 4 : 5 Sum of ratio = 4 + 5 = 9 No. of junior pupils in the school = $\frac{5}{9}$ x $\frac{750}{1}$ √ = $\frac{5}{1}$ x $\frac{80}{1}$ = 400 √ Hence there are 400 junior pupils in the school	(2)	1 mark for calculation 1 mark for answer
2.3	Let amount for worker C be represented by x If C gets x Then B gets 100 + x And A gets 200 + (100 + x) Thus x+ (100 + x) + 200 + (100 + x) = 1 300 √ 3x + 400 = 1 300 3x = 1 300 – 400 3x = 900 $\frac{3x}{x} = \frac{900}{3}$ x = 300 Hence Worker C will get R300,00 √	(2)	1 mark for calculation 1 mark for the answer
		[10]	
QUESTION 3			
3.1		(2)	2 marks for correctly completing the table 1 mark for a wrong value in table

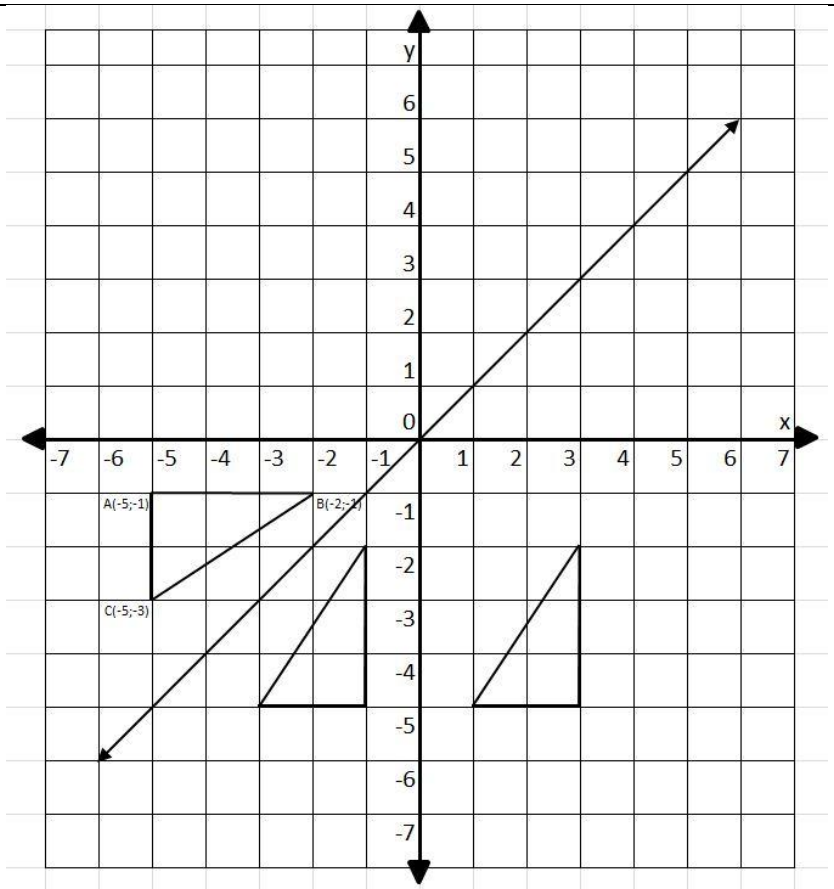
°C	0	20	40	60	80
°F = $\frac{5}{9}$ °C + 32	32	68	104	140	176

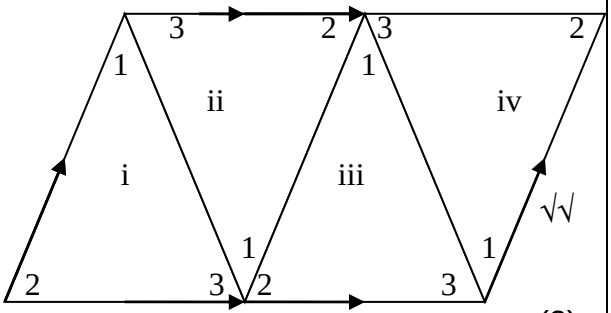
√√

3.2				2 marks plotting all points correctly 1 mark for at least a wrong point
3.3	3.3.1	The first term : 5(1) + 1 = 6 The second term : 5(2) + 1 = 11 The third term : 5(3) + 1 = 16 and so on The rule is the product of 5 and the rack number plus 1 i.e. 5n +1 √√	(2)	2 marks for getting rule correct
	3.3.2	5n + 1 = 46 √ 5n + 1 – 1 = 46 – 1 5n = 45 $\frac{5n}{n} = \frac{45}{5}$ n = 9 Teddy can develop rack number 9 with 46 pieces √	(2)	1 mark for the equation 1 mark for the answer
3.4	The graph intersects y-axis at point (0, -2) ∴ C = -2 If x = 1 ; y = 0 mx + C = 0 (m x 1) – 2 = 0 m – 2 = 0 2 = 0 + 2 m = 2 √ the equation is y = 2x – 2 √		(2)	1 mark for finding the value of m 1 mark for the correct equation
			[10]	

QUESTION 4				
4.1	4.1.1	$24x^3y^2 - 8x^2y - 16x^2y^2$ $= 8x^2y\,(3xy - 1 - 2y)$ √√	(2)	Answer
	4.1.2	$m^2(m-2) - 4(m-2)$ $= (m-2)(m^2 - 4)$√ $= (m-2)[(m-2)(m+2)]$ √√	(3)	1 mark for taking out correct factor 2 marks Factorising to get difference of 2 squares
4.2	4.2.1	$4x - (3x-7) - (2x-3) = 8(x-1)$ $4x - 3x + 7 - 2x + 3 = 8x - 8$√ $-x + 10 = 8x - 8$ $-x - 8x = -8 - 10$ $-9x = -18$ √ $\frac{-9x}{-9} = \frac{-18}{-9}$ hence $x = 2$ √	(3)	1 mark for removing the brackets 1 mark for simplifying and finding the like terms Answer
	4.2.2	$\frac{x^2}{x^2-3x} = \frac{x-3}{x-5}$ $\frac{x^2}{x(x-3)} = \frac{x-3}{x-5}$ √ $\frac{x}{x-3} = \frac{x-3}{x-5}$ $(x-3)(x-3) = x(x-5)$ $x^2 - 6x + 9 = x^2 - 5x$ √ $x^2 - x^2 - 6x + 5x = -9$ √ $-x = -9$ $\therefore x = 9$ √	(4)	1 mark for factorising left side 1 mark for cross multiplication 1 mark for simplifying like terms Answer
	4.2.3	$2^{4x} = 2^8$ √ $4x = 8$ $x = 2$ √	(2)	1 mark for writing 256 in exponential form Answer

4.3	4.3.1	$3^{2n+3}.3^{-n-5}$ $= 3^{2n+3+(-n-5)}$ $= 3^{2n+3-n-5}$ √ $= 3^{n-2}$ √	(2)	1 mark for simplification 1 mark for answer
	4.3.2	$\frac{15a(ab)^2}{7c^5} \div \frac{5ab}{21c^3}$ $= \frac{15a^3b^2}{7c^5} \div \frac{21c^3}{5ab}$ √ $= \frac{3a^2b}{7c^2} x \frac{3}{1}$ √ $= \frac{9a^2b}{7c^2}$ √	(3)	1 mark for changing division to multiplication and inverting fraction on the right 1 mark for simplification of numerical coefficients Answer
	4.3.3	Let 54 321 = x Then 54 323 = $x + 2$ 54 319 = $x - 2$ And $54\,321^2 - (54\,323)(54\,319) = x^2 - (x+2)(x-2)$ √ $= x^2 - (x^2 - 4)$ $= x^2 - x^2 + 4$ = 4 √	(2)	1 mark for equation Answer
			[21]	

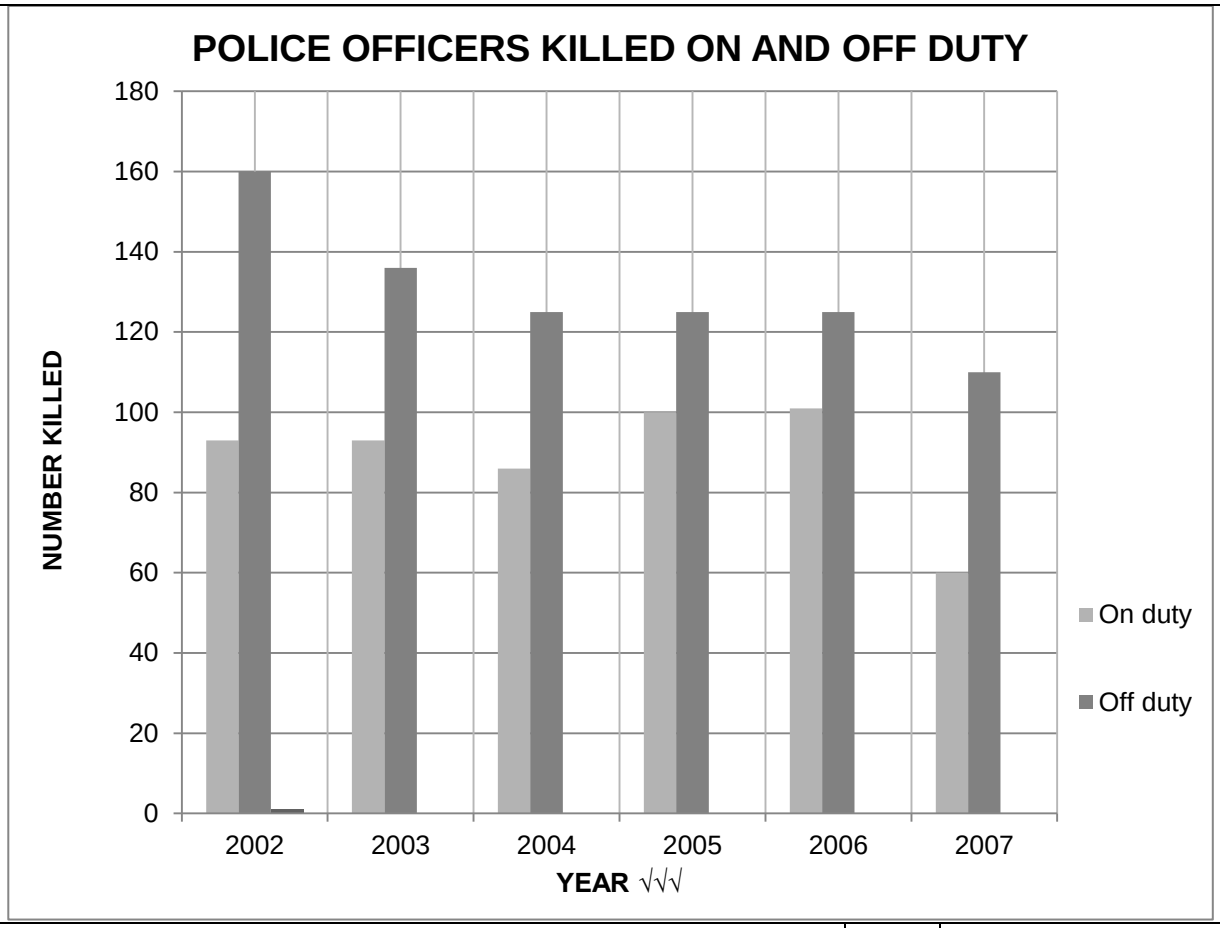
QUESTION 5				
5.1				1 mark for reflected image 1 mark for correct shape and size of image
	5.1.1	Refer to reflected image in diagram above √√	(2)	
	5.1.2	$(x\ ,\ y)$ ⟶ $(y\ ,\ x)$ √	(1)	
	5.1.3	See the translated image in the diagram above. √	(1)	
5.2	Let the required length be x $\frac{18}{10} = \frac{x}{8}$ √ $10x$ = 146 √ $\frac{10x}{10} = \frac{146}{10}$ x = 14,6 ∴ 18 m ladder is 14,6 m up the wall. √		(3)	1 mark for setting the corresponding sides 1 mark for cross multiplication Answer

5.3	5.3.1	 (2)		Correctly completing the shapes
	5.3.2	Parallelogram √	(1)	Answer
	5.3.3	Any 2 (i) Both pairs of opposite sides are parallel (ii) Both pairs of opposite sides are equal (iii) Both pairs of opposite angles are equal (iv) Diagonals bisect each other (v) One pair of opposite sides are equal and parallel √√	(2)	1 mark per each correct property stated
5.4	5.4.1	$\angle BCD$ or $\angle DCB$ √	(1)	
	5.4.2	$\angle ABC$ or $\angle CBA$ √	(1)	
5.5	$\angle FEG = \angle DEC$ vertically opp $\angle s$ √ $\angle FEG = 40°$ $\angle y + 85° + 40° = 180°$ sum $\angle s$ of a Δ √ $\therefore \angle y = 55°$ √		(3)	1 mark for reason 1 mark for reason 1 mark for answer
			[17]	

QUESTION 6				
6.1	6.1.1	Volume of prism = base area x height √ = l x b x h = 9 m x 7 m x 5 m = 315 m^3 √	(2)	Formula Answer
	6.1.2	1 m = 100 cm 1 m^3 = 1 000 000 cm^3 315 m^3 = 315 x 1 000 000 cm^3 315 m^3 = 315 000 000 cm^3 √	(1)	Correct conversion units Answer
6.2	6.2.1	Let the number of yards be represented by k 1 metre = 1,094 yards 5 metres = k yards k = 5 x 1,094 √ k = 5,47 yards ∴ The sister must buy *5,47 yards* of cloth material. √	(2)	 Cross multiplication Answer
	6.2.2	Let length in metres be p 1 metre = 1,094 yards p metres = 8 yards 1,094 p = 8 p = $\frac{8}{1,094}$ = 7,31 metres √ The extra length = 7,31 – 5 = 2,31 metres √ Hence 2,31 metres of the cloth material will be left over after making Andiswa's dress.	(2)	 Converted units Answer

6.3	6.3.1	$BF^2 = (15\text{ cm})^2 + (8\text{ cm})^2$ Pythagoras Theorem √ $= 225\text{ cm}^2 + 64\text{ cm}^2$ BF = $\sqrt{289\text{ cm}^2}$ BF = 19 cm √	(2)	1 mark for stating theorem 1 mark for correct answer
	6.3.2	In Δ DFE and Δ BAC DF = BA opposite sides of rect. ABDF √ FE = AC opposite sides of rect. ACEF √ DE = BC opposite sides of rect. BCED √ Δ DFE ≡ Δ BAC SSS √	(4)	1 mark for each reason
			[13]	
QUESTION 7				
7.1	7.1.1	Fraction allocated to defence = $\frac{43{,}2°}{360°}$ = $\frac{3}{25}$ √	(1)	Answer simplified
	7.1.2	Welfare – $\frac{79{,}2}{360}$ x 100 = 22% √ Education – $\frac{97{,}2}{360}$ x 100 = 27% √	(2)	1 mark for each correct answer
	7.1.3	Percentages are 6; 12; 15; 18; 22 and 27 Stem: 0 | Leaf: 6 Stem: 1 | Leaf: 2 5 8 Stem: 2 | Leaf: 2 7 √√	(2)	1 mark for Stem-Leaf Diagram 1 mark for correct order Do not penalise for using wrong percentages from QUESTION 7.1.2
	7.1.4	Mean = $\left(\frac{15+6+12+18+22+27}{6}\right)\%$ = $\frac{100}{6}\%$ √ = 16,7% √	(2)	Sum of percentages Answer Do not penalise for using wrong percentages from QUESTION 7.1.2

7.2



(3) 3 marks for getting all bars correct, a missing set gets 1 mark

7.3 7.3.1 Median $= \frac{57 + 59}{2} = \frac{116}{2}$ √

$= 58$ √ (2) 1 mark for identifying middle 2 values Answer

7.3.2 Range = 90 – 30 = 60 √

7.4

Class	Tally	Frequency
21 – 35	I	1
36 – 50	~~IIII~~ I	6
51 – 65	~~IIII~~	5
66 – 80	~~IIII~~	5
81 – 95	III	3

√√√ (3)

1 mark for getting 5 classes correct

1 mark for Tallies

1 mark for frequency

7.5	7.5.1	P (blue socks or yellow socks) $= \frac{2}{14} + \frac{3}{14}$ $= \frac{5}{14}$ √	(1)	1 mark for correct answer
	7.5.2	P (no white socks) $= \frac{14}{14} - \frac{5}{14}$ $= \frac{9}{14}$ √	(1)	1 mark for correct answer
	7.5.3	P (odd numbered pairs of socks) $= \frac{3}{14} + \frac{5}{14}$ $= \frac{8}{14}$ $= \frac{4}{7}$ √	(1)	1 mark for correct answer
			[19]	
		TOTAL:	**100**	