basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2010

MEMORANDUM

MARKS: 150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/Reading from a graph
SF	Correct substitution in a formula
O	Opinion/Example
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off

This memorandum consists of 18 pages.

QUESTION 1 [33 MARKS]			
ANSWER ONLY: If totally correct – Full marks; Otherwise 0 ***No penalties if units of measurement are omitted***			
Ques	**Solution**	**Explanation**	**AS**
1.1.1 (a)	$15,43 + 46,08 \times 15,6875$ $= 15,43 + 722,88$ ✓A $= 738,31$ ✓CA	1A multiplying 1CA simplifying NO MARKS – If order of operation is incorrect (2)	12.1.1
1.1.1 (b)	$\frac{17-5}{3} \times (29,35 - 10,63) = \frac{12}{3} \times 18,72$ ✓A $= 74,88$ ✓CA	1A simplifying both the bracket and fraction 1CA simplifying NO penalty for rounding (2)	12.1.1
1.1.2	$2,875 = \frac{2\,875}{1000}$ ✓M $= 2\frac{7}{8}$ **OR** $\frac{23}{8}$ ✓A **OR** $2,875 = 2\frac{875}{1000}$ ✓M $= 2\frac{7}{8}$ ✓A	1M Changing from decimal to fraction form 1A simplified fraction No marks if $\frac{1\,000}{2\,875}$ used. (2)	12.1.1
1.1.3	ZAR 110,35 $= 110,35 \times 9,48$ DZD ✓M $= 1\,046,118$ DZD **OR** 1 046,12 DZD ✓A	1M multiplication 1A amount in dinar No rounding off penalties Max 1 mark if given in rand (2)	12.1.1

ANSWER ONLY: If totally correct – Full marks ; Otherwise 0 *No penalties if units of measurement are omitted*			
Ques	**Solution**	**Explanation**	**AS**
1.1.4	3 024 cm = 3 024 ÷ 100 m ✓M = 30,24 m ✓A	1M division by 100 1A correct simplification No penalty if incorrect units are given (2)	12.3.2
1.1.5	$6\frac{1}{4}\%$ of 420 000 $= \frac{6,25}{100} \times 420\,000$ ✓M $= 0,0625 \times 420\,000$ = 26 250 ✓A **OR** $6\frac{1}{4}\%$ of 420 000 $= \frac{25}{4}\%$ of 420 000 ✓M $= \frac{25}{400} \times 420\,000$ = 26 250 ✓A	1M multiplication with correct percentage 1A correct simplification Do not accept 630 000 (2)	12.1.1
1.1.6	Percentage Profit $= \frac{R1\,840 - R1\,150}{R1\,150} \times 100\%$ ✓M = 60% **OR** 0,6 **OR** $\frac{60}{100}$ ✓A	1M correct substitution 1A percentage profit No marks for – 37,5% Max 1 mark for – 60% (2)	12.1.3
1.2.1	21 ✓A	1A number of classes (1)	12.1.1
1.2.2 (a)	3 learners ✓✓A	2A mode (2)	12.4.3
1.2.2 (b)	3 learners ✓✓A	2A median (2)	12.4.3

Ques	Solution	Explanation	AS
ANSWER ONLY: If totally correct – Full marks ; Otherwise 0 ***No penalties if units of measurement are omitted***			
1.3.1	Volume = 50 cm × 40 cm × 45 cm ✓M = 90 000 cm^3 ✓CA	1M substituting correct values 1CA volume (2)	12.3.1
1.3.2	Height of liquid = $\frac{3000\,cm^3}{50\,cm \times 40\,cm}$ ✓M/A = $1\frac{1}{2}$ cm **OR** 1,5 cm **OR** $\frac{3}{2}$ cm ✓A	1M/A accurate substitution 1A simplification (2)	12.3.1
1.4.1	Daily payment = R12,50 × $8\frac{1}{2}$ ✓S = R 106,25 ✓CA **OR** Daily payment = R12,50 × 8 + $\frac{R12,50}{2}$ ✓S = R 106,25 ✓CA **OR** Daily payment = (R12,50 × 8) + (R12,50 ÷ 2) ✓S = R 100 + R6,25 = R106,25 ✓CA	1S substitution 1CA simplification Max 1 mark if rounded off to 9 hours (2)	12.2.1
1.4.2	Number of hours worked = $\frac{R218,75}{R12,50}$ ✓M = 17,5 or $17\frac{1}{2}$ ✓A	1M dividing by correct values 1A simplification Full marks if set out as: R12,50 × 17,5 = R218,75 (2)	12.1.1
1.5.1	10 hours ✓✓A	2A reading from graph (2)	12.2.3
1.5.2	5 ✓✓A	2A reading from graph (2)	12.2.3
1.5.3	7 hours and 30 minutes ✓✓A **OR** 7,5 hrs ✓✓A	2A correct number of hours Accept any time between 7 and 8 hours (2)	12.2.3
			[33]

QUESTION 2 [33 MARKS]			
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
2.1.1 (a)	Lateral surface area of the cylindrical holder = 2 × 3,14 × 5 cm × 15 cm ✓SF = 471 cm² ✓A	1SF substitution of correct radius and height 1A total surface area Accept 471,24 cm² or 471,43 cm² (2)	12.3.1
2.1.1 (b)	Lateral surface area of the rectangular holder = 2 × (8 + 10) cm × 15 cm ✓SF = 2 × 18 cm × 15 cm ✓S = 540 cm²✓CA	1SF substitution 1S correct addition 1CA total surface area in cm^2 Max 1 mark if incorrect formula is used Penalty if units omitted (3)	12.3.1
2.2.1	33 minutes ✓RG	1RG correct reading (1)	12.2.3
2.2.2	6 minutes ✓✓RG	2RG correct reading (2)	12.2.3
2.2.3	12 minutes – 6 minutes✓RT = 6 minutes ✓A	1RT correct values from the table 1A correct minutes (2)	12.2.3
2.2.4	2 500 m ✓✓RG	2RG correct reading Accept any value greater than 0 up to and including 3 000 m (2)	12.2.3
2.2.5	27 minutes ✓✓RG	2RG correct reading (2)	12.2.3

Ques	Solution	Explanation	AS
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
2.2.6	10:55 + 12 minutes ✓M = 11:07 ✓A	1M adding 1A solution Max 1 mark if given as 10:67 (2)	12.3.1
2.2.7	Average speed = $\frac{3000\,\text{m}}{6\,\text{min}}$ ✓A ✓A = 500 m/min ✓CA	1A correct distance 1A correct time 1CA simplifying 2 marks if using 1 000 m No penalty if units omitted. Max 2 marks if answer in km/h (3)	12.2.1
2.3.1	47,1 % – 42,7% ✓RT = 4,4 % ✓CA	1RT correct values selected 1CA percentage decrease Accept – 4,4% No penalty if % is omitted (2)	12.1.1 12.4.4

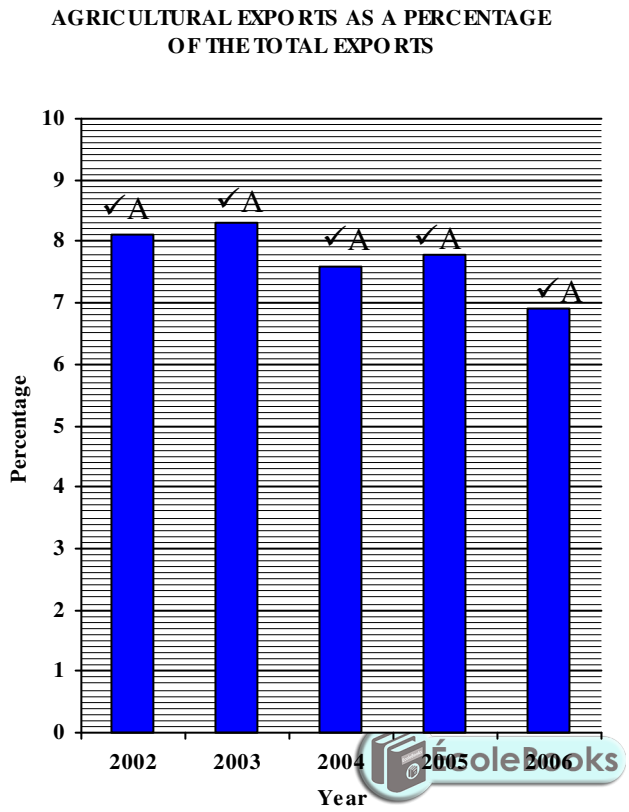
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
2.3.2 (a)	$A = \frac{4\,720\,000}{10{,}0\,\%}$ **OR** $\frac{4\,720\,000}{0{,}10}$ ✓M ✓RT $= 47\,200\,000$ ✓CA **OR** 10,0% of the population is 4 720 000 ✓RT $\therefore 1\%$ of the population is $\frac{4\,720\,000}{10{,}0\,\%}$ ✓M $\therefore 100\%$ of the population is $\frac{4\,720\,000}{10{,}0\,\%} \times 100\%$ $= 47\,200\,000$ ✓CA **OR** 10% of the population is 4 720 000 ✓RT 100% of the population = 10 × 4 720 000 ✓M = 47 200 000 ✓CA	1M method 1RT correct values selected 1CA correct population (3)	12.1.1 12.4.4
2.3.2 (b)	B = 45,0% × 621 600 ✓M ✓RT = 0,450 × 621 600 = 279 720 ≈ 279 700 ✓CA	1M method 1RT correct values selected 1CA rounded to nearest hundred (3)	12.1.1 12.4.4
2.3.2 (c)	$C = \frac{5\,060\,000}{48\,653\,800} \times 100$ ✓RT ✓RT = 10,40000987 ≈ 10,4 ✓CA	2RT correct values selected 1CA rounded to 1 decimal place No penalty if given as 10,4% (3)	12.1.1 12.4.4

ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
2.3.3	49 320 500 : 5 210 000 ✓RT $= 1 : \frac{5\ 210\ 000}{49\ 320\ 500}$ ✓M = 1 : 0,105 635 5 ≈ 1 : 0,1 ✓CA	1RT reading correct values 1M correct ratio 1CA simplifying ratio rounded to one decimal place Max 2 marks if order is changed and the answer is 1 : 9,5 Max 1 mark if written as a fraction (3)	12.1.11 2.4.4
			[33]

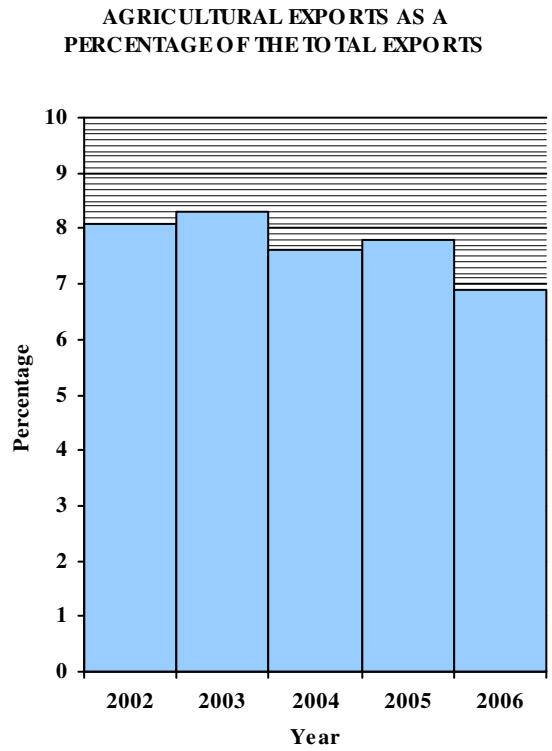
QUESTION 3 [19 MARKS]			
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
3.1.1	R25 460 000 000 + R22 670 000 000 + R22 074 000 000 + R25 458 000 000 + R26 978 000 000 ✓M = R122 640 000 000 or R122 640 million ✓A	1M adding correct values 1A simplifying to the correct value Max 1 for R 1 599 565 000 000 or R1 599 565 million Penalty of 1 mark if million left out in either 3.1.1 or 3.1.2 (2)	12.4.4 12.1.1
3.1.2	R 273 127 million R 292 079 million R 314 927 million ✓M R 326 385 million R 393 047 million ✓A	1M arrangement in ascending order 1A correct values Penalty of 1 mark if million left out in either 3.1.1 or 3.1.2 NO marks for descending order Max 1 mark if incorrect column values are arranged (2)	12.4.4

Ques	Solution	Explanation	AS
3.1.3		5A one for each correct bar Do **NOT** penalise if no gaps between bars Do **NOT** penalise if the spaces between bars are uneven and the bar widths are unequal Maximum of 3 marks if a line graph is drawn Bars can also be represented as vertical lines (5)	12.4.2

2002	2003	2004	2005	2006
8,1 %	8,3 %	7,6 %	7,8 %	6,9 %



OR



ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
3.2.1	$450\,000\ m^2 = \frac{450\,000}{10\,000}$ ha ✓M $= 45$ ha ✓A **OR** $10\,000\ m^2 = 1$ ha Therefore $450\,000\ m^2 = 45 \times 10\,000\ m^2$ ✓M $= 45$ ha ✓A	1M division by 10 000 1A number of hectares **OR** 1M concept 1A number of hectares No penalty if units omitted (2)	12.3.2
3.2.2	Number of hectares $= \frac{5000}{0,65}$ ha ✓M $= 7\,692,3$ ha ✓A $\approx 7\,692$ ha ✓CA	1M dividing 1A number of hectares 1CA rounding off (3)	12.1.1 12.2.1
3.2.3	Fertiliser needed $= 4,32 \times 2\,000$ kg ✓M✓A $= 8\,640$ kg ✓CA	2 M/A multiplication with correct values 1CA simplifying Max 2 marks if divided by 4,32 (3)	12.1.1 12.2.1
3.2.4	$\frac{0,65}{4,32} \times \frac{100\%}{1}$ ✓M $= 15,046\ \%$ **OR** $\approx 15,05\ \%$ ✓A	1M concept 1A solution No penalty if % omitted No penalty for rounding (2)	12.1.1
			[19]

QUESTION 4 [19 MARKS]				
ANSWER ONLY: If totally correct – Full marks; Otherwise 0				
Ques	**Solution**	**Explanation**		**AS**
4.1.1	Increasing ✓A ✓A	No penalty for omitting units	2A type of function (2)	12.2.1
4.1.2	32 °F ✓✓RG		2RG correct reading Accept 31 °F to 33 °F (2)	12.2.3
4.1.3	40 °C ✓✓RG		2RG correct reading (2)	12.2.3
4.1.4	21 °F ✓✓RG ✓R		2RG correct reading 1R rounding Accept 22 °F (3)	12.2.3
4.1.5	Range = 17 °C – (–2 °C) ✓M ✓A = 17 °C + 2 °C = 19 °C ✓CA		1M calculating the range 1A correct values 1CA range max of 2 marks if : –19 °C or 15 °C or from –2 °C to 17 °C or [–2 °C ; 17 °C] (3)	12.2.3 12.1.2 12.4.3
4.2.1	Total Entrance fee = (4 + 5) × R3,50 ✓A + 10 × R6,50 ✓A = R31,50 + R65,00 = R96,50 ✓CA		2A substitution of correct values 1CA solution (3)	12.2.1 12.1.1
4.2.2	Perimeter = 3,14 × 5 m ✓SF = 15,7 m ✓A		1SF substitution 1A simplifying Accept 15,71 m or 15,714 m No marks if diameter is not 5 m No penalty for omitting units (2)	12.3.1

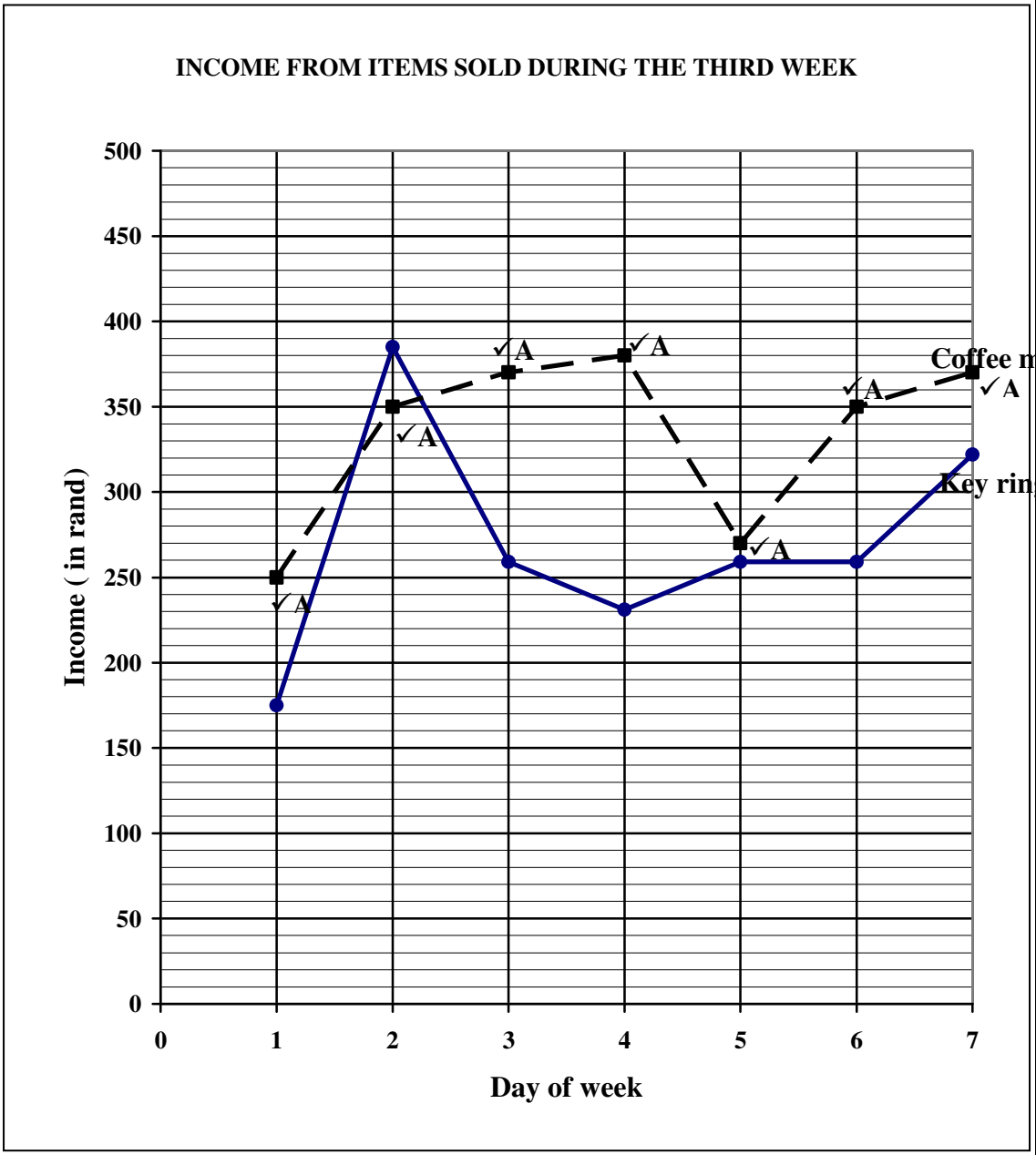
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
4.2.3	$6\,000\ \ell = \frac{6\,000}{4{,}546}$ gallons ✓M $= 1\,319{,}8416..$ gallons $\approx 1\,319{,}84$ gallons ✓A **OR** $1\ \ell = \frac{1}{4{,}546}$ gallon $\therefore 6000\ \ell = \frac{1}{4{,}546} \times 6000$ gallons ✓M $= \frac{6\,000}{4{,}546}$ gallons $= 1\,319{,}8416..$ gallons $\approx 1\,319{,}84$ gallons ✓A	1 M dividing 1A number of gallons Accept up to 1 320 gallons (2)	12.3.2
			[19]

QUESTION 5 [22 MARKS]			
ANSWER ONLY:	***If totally correct – Full marks; Otherwise 0***		
Ques	**Solution**	**Explanation**	**AS**
5.1.1	South Westerly ✓ A **OR** SW **OR** SSW **OR** WS **OR** S45°W **OR** West of South **OR** South of West	1A direction (1)	12.3.4
5.1.2	Perimeter of Mr Khoso's plot: ✓ A ✓ M = 224 m + 200 m + 150 m + 200 m + 250 m = 1 024 m ✓ CA	1M Concept of perimeter 1A using correct values 1CA sum of the lengths (3)	12.3.1
5.1.3	Volume = 3,14 × (10 m)² × 2 m ✓ SF = 628 m³ ✓ A ✓ A	1SF substitution 1A simplifying 1A correct units Accept 628,32 m^3 OR 628,57 m^3 Max 1mark if radius not squared (3)	12.3.1
5.1.4	Area of a cattle kraal = $\frac{1}{2}$ × 200 m × 200 m ✓ A ✓ SF = 20 000 m² ✓ CA	1A height 1SF substitution 1CA simplifying Max 2 marks if area is equal to 22 400 m^2 (3)	12.3.1

ANSWER ONLY:	*If totally correct – Full marks; Otherwise 0*		
Ques	**Solution**	**Explanation**	**AS**
5.1.5	Area of Mr Khoso's plot $= \frac{1}{2} \times (200\text{ m} + 150\text{ m} + 250\text{ m}) \times 200\text{ m}$ ✓A ✓SF $= \frac{1}{2} \times 600\text{ m} \times 200\text{ m}$ ✓A $= 60\,000\text{ m}^2$ ✓CA **OR** Area = Area of triangle + Area of trapezium $= \frac{1}{2} \times 200\text{m} \times 200\text{m} + \frac{1}{2}(150\text{m} + 250\text{m}) \times 200\text{m}$ ✓A ✓SF $= 20\,000\text{ m}^2 + \frac{1}{2}(400\text{ m}) \times 200\text{ m}$ ✓A $= 20\,000\text{ m}^2 + 40\,000\text{ m}^2$ $= 60\,000\text{ m}^2$ ✓CA	1A adding correct parallel sides 1SF substitution 1A correct values 1CA simplifying Max 2 marks if area of vegetable garden is calculated as 5 625 m^2 (4)	12.3.1
5.2.1	Total mass = 2 × 2 kg + 12 × 0,12 kg ✓M = 4 kg + 1,44 kg = 5,44 kg ✓A	1M multiplying and adding 1A simplifying (2)	12.3.1 12.2.1
5.2.2 (a)	A = 2 × 12 ✓M = 24 ✓A **OR** A = 4 × 6 ✓M = 24 ✓A	1M multiplying 1A number of carrots (2)	12.2.1

ANSWER ONLY:	*If totally correct – Full marks; Otherwise 0*		
Ques	**Solution**	**Explanation**	**AS**
5.2.2 (b)	2 cabbages in 1 box 24 cabbages in $\frac{24}{2}$ boxes ✓ M = 12 boxes ✓ A **OR** B = $\frac{144}{12}$ ✓ M B = 12 boxes ✓ A **OR** 1 box = 14 vegetables B = $\frac{168}{14}$ ✓ M = 12 ✓ A **OR** B = $\frac{5\times24}{10}$ ✓ M = 12 ✓ A	1M dividing correct values 1A number of boxes (2)	12.2.1
5.2.3	12 cabbages in 6 boxes ✓ M Number of carrots = 6 × 12 = 72 ✓ CA **OR** 5 boxes have 10 cabbages and 60 carrots 1 box has 2 cabbages and 12 carrots } ✓ M ∴ (60 + 12) carrots = 72 carrots ✓ CA	1M number of boxes 1CA number of carrots 1M both statements 1CA number of carrots (2)	12.2.1
			[22]

QUESTION 6 [24 MARKS]			
ANSWER ONLY: If totally correct – Full marks; Otherwise 0			
Ques	**Solution**	**Explanation**	**AS**
6.1.1	Mean ✓ M $= \frac{25+55+37+34+37+37+46+37+37+40+33+37+37+40}{14}$ ✓ M $= \frac{532}{14}$ = 38 ✓ A	1M sum 1M dividing the sum of scores 1A simplifying max 1 mark if coffee mugs used (3)	12.4.3
6.1.2	P(37 key rings) = $\frac{7}{14}$ ✓A ✓A = $\frac{1}{2}$ ✓CA	1A correct numerator 1A correct denominator 1CA simplified fraction Max 2 marks for 50% or 0,5 (3)	12.4.5 12.1.1
6.1.3 (a)	Range = 38 – 25 ✓ A = 13 coffee mugs ✓ A	1A minimum & maximum values 1A range Accept –13 Max 1 mark if key rings used (2)	12.4.3
6.1.3 (b)	✓A ✓A Mode = 35 and 37	2A mode (2)	12.4.3
6.1.3 (c)	Median = $\frac{35+35}{2}$ ✓ M = 35 ✓ A	1M finding median 1A median (one value only) (2)	12.4.3
6.2.1	Income = 128 × R7,00 ✓ M = R896,00 ✓ CA	1M calculating income 1CA income 1 mark for 128 × R4,80 = R614,40 (2)	12.1.3

6.2.2 (a)	***NOTE: To assist with marking, the graph that the learner has to draw is represented as a dotted line. The learners DO NOT have to draw a dotted line.***  A plotting (1;250) 1A plotting (3;370) 1A plotting (4;380) 1A plotting (2;350) 1A plotting (5;270) 1A plotting (6;350) 1A plotting (7;370) 1CA joining the points with a line Max 6 marks if incorrect type of graph is drawn (8)		12.2.2
6.2.2 (b)	Day 2 ✓✓ RG/RT	2RG/RT correct days (2)	12.4.4
			[24]
		TOTAL:	**150**