MATHEMATICS MODEL QUESTIONS AND ANSWERS FOR STANDARD 8

(SIR. T.PHIRI 2019 EDITION) ***(CELL: 0884 429 789)***

UNIT 1. ROMAN NUMERALS

1. Convert 110 to Roman numerals **(2marks)**
   = CX

2. Convert 175 to Roman numerals **(2marks)**
   = CLXXV

3. Convert 99 to Roman numerals **(2marks)**
   = XCIX

4. Change 217 to Roman numerals **(2marks)**
   = CCXVII

5. Change **XCIX** into Hindu Arabic numerals **(2marks)**
   XCIV = 90 + 9
   =99

6. Change **XVIII** into Roman Arabic numerals **(2marks)**
   XVIII = 10 + 5 + 1 + 1 + 1
   =18

7. Write **XCVI** to Hindu Arabic numerals **(2marks)**
   XCVI = 90 + 5 + 1
   = 96

8. Express **XXXVIII** to Hindu Arabic numerals **(2marks)**
   XXXVIII = 10 + 10 + 10 + 5 + 1 + 1 + 1
   = 38

9. Arrange **XVIII , IV, XIX, XI, XX** in descending order **(2marks)**
   = XX, XIX, XVII, XI, IV

Arrange **III, XII, XV, XIX** in descending order **(2marks)**

=XIX, XV, XII, III

Arrange **CXXX, CL, DCX, DCCL ,DL** in descending order **(2marks)**

=DCCL, DCX, DL, CXXX, CL

Arrange **L, XL, XXX, XVII, XV** in ascending order **(2marks)**

= XV, XVI, XXX, XL, L

Arrange **V, XVIII, VI, XI, XX, VII** in ascending order **(2marks)**

= V, VI, VII, XI, XVIII, XX

Arrange **VI, XIX, XIV, III, V** in ascending order **(2marks)**

= III, V, VI, XIV, XIX

Fill the missing numerals **V, VI, VII, ___, IX , __, ___, XII** **(2marks)**

= V, VI, VII, VIII, IX, X , XI, XII

Fill the missing numerals **X, ___, VIII, __, ___, V, IV** **(2marks)**

= X, IX, VIII, VII, VI, V, IV

Fill the missing numerals **C, XC, ____, LXX, ___, ____, XL** **(2marks)**

= C, XC, LXXX, LXX, LX, L , XL

- ✓ ASCENDING ORDER MEANS FROM THE SMALLEST TO THE LARGEST
- ✓ DESCENDING ORDER MEANS FROM THE LARGEST TO THE SMALLEST

UNIT 2. HIGHEST COMMON FACTOR AND LOWEST C0MM0N MULTIPLE

- ❖ A Factor is a number that goes into another number without leaving a remainder
- ❖ A multiple is a number that is divided by a factor without leaving a remainder

- HCF is the largest number that divides into the given numbers without a remainder
- It can be solved by using the following methods
  - i. Factors method
  - ii. Division method
  - iii. Continued division method

KEY WORDS= **LARGEST NUMBER, BIGEST NUMBER, HIGHEST NUMBER.**

1. Find the HCF of 105, 156 and 180 using factor method **(5marks)**

   $105 = 3 \times 5 \times 7$

   $156 = 2 \times 2 \times 3 \times 13$

   $180 = 2 \times 2 \times 3 \times 3 \times 5$

   HCF **= 3** (because it appears in all three numbers)

2. Calculate the HCF of 1040 and 720 by factor method **(5marks)**

   $1040 = 2 \times 2 \times 2 \times 2 \times 5 \times 13$

   $720 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$

   $HCF = 2 \times 2 \times 2 \times 2 \times 5$

   = 80

3. Find the HCF 0f 80, 320 and 720 using factor method **(5marks)**

   $80 = 2 \times 2 \times 2 \times 2 \times 5$

   $320 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5$

   $720 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$

   $HCF = 2 \times 2 \times 2 \times 2 \times 5$

   = 80

4. Calculate the HCF of 18 , 24 and 36 using division method **(5marks)**

2	18	24	36
2	9	12	18
2	9	6	9
3	9	3	9
3	3	1	3
	1	1	1

HCF = 2×3

= 6

5. Find the HCF of 45, 90 and 15 using division method **(5marks)**

2	45	90	15
3	45	45	15
3	15	15	5
5	5	5	5
	1	1	5

HCF = 3×5

= 15

6. Find the HCF of 105, 156 and 180 by division method **(5marks)**

2	1040	720
2	520	360
2	260	180
2	130	90
3	65	45
3	65	15
5	65	5
13	13	1
	1	1

HCF = 2×2×2×2×5

= 80

Calculate the HCF of 1040 and 720 by continued division method **(5marks)**
[2011 Q. 22]

2	720 → 1040		1
	-640	- 720	4
	80 →	320	4
		- 320	
		0	

HCF **= 80**

OR

$$720\overline{)1040}\ 1$$
$$-\ 720$$
$$320$$

$$320\overline{)720}\ 2$$
$$-\ 640$$
$$80$$

$$80\overline{)320}$$
$$-\ 320$$
$$0$$

∴ HCF = **80**

7. Find the HCF of 360, 504 and 864 using continued division method **(5marks)**

2	360 →	504	1
	- 288	- 360	
	72 →	144	2
		- 144	
		0	
	72 →	864	12
		- 864	
		0	

HCF **= 72**

8. Calculate the HCF of 289 and 357 by continued division method **(5marks)**

4	289 →	357	1
	- 272	- 289	
	17 →	68	4
		- 68	
		0	

HCF **= 17**

9. Find the largest number of learners that can share 56 sweets, 60 biscuits and 72 slices of bread without a remainder. **(5marks)**

2	56	60	72
2	28	30	36
2	14	15	18
3	7	15	9
3	7	5	3
5	7	5	1
7	7	1	1
	1	1	1

HCF = 2×2

= 4

EXERCISE 1

1. Calculate the HCF of 473, 559 and 645 using continued division method **(5marks) [43]**
2. Find the HCF of 70, 84 and 105 using factor method **(5marks) [7]**
3. Calculate the HCF of 120 and 75 by division method **(5marks) [15]**

(ii) LOWEST COMMON MULTIPLE (LCM)

KEY WORDS ARE: **LEAST NUMBER,SMALLEST NUMBER.**

- This is a smallest number that can be divided by the number without a remainder.
- We can find LCM using two respective methods
  i. Factor method
  ii. Division method

1) Find the LCM of 156, 105 and 180 using factor method **(5marks)**

156 = 2×2×3×13

105 = 3×5×7

180 = 2×2×3×3×5

LCM = 2×2×3×3×5×7×13

= 16,380

2) Calculate the LCM of 70, 84 and 105 by factor method **(5marks)**

70 = 2×5×7

84 = 2×2×3×7

105 = 3×5×7

LCM = 2×2×3×5×7

= 420

3) Find the smallest number which is a multiple of 15, 18, 24 and 27 **(5marks)**

15 = 3×5

18 = 2×3×3

24 = 2×2×2×3

27 = 3×3×3

LCM = 2×2×2×3×3×3

= 216

(4) What is the least number of pencils that can be shared among 12 girls, 10 boys, 2 head teachers and 6 teachers without a remainder?

(5marks)

12 = 2×2×3

10 = 2×5

2 = 2

6 = 2×3

LCM = 2×2×3×5

= 60

4) Calculate the LCM of 156, 105 and 180 using division method **(5marks)**

2	105	156	180
2	105	78	90
3	105	39	45
3	35	13	15
5	35	13	5
7	7	13	1
13	1	13	1
	1	1	1

LCM = 2×2×3×3×5×7×13

= 16,380

5) Find the LCM of 10, 14, 50 and 40 using division method **(5marks)**

2	10	14	50	40
2	5	7	25	20
2	5	7	25	10
5	5	7	25	5
5	1	7	5	1
7	1	7	1	1
	1	1	1	1

LCM = 2×2×2×5×5×7

= 1400

(6) A shopkeeper bought cartons of soap in multiples of 20, 30 and 60 at a wholesale price. Find the least number of cartons the wholesale bought. **(5marks)**

	20	30	60
2			
	10	15	30
2			
	5	15	15
3			
	5	5	5
5			
	1	1	1

LCM = 2×2×3×5

= 60

7. Divide the LCM of 27, 96 and 105 by their HCF **(7marks)**

	27	96	105
2			
	27	48	105
2			
	27	24	105
2			
	27	12	105
2			

2	27	6	105
3	27	3	105
3	9	1	35
3	3	1	35
5	1	1	35
7	1	1	7
	1	1	1

LCM = 2×2×2×2×2×3×3×3×5×7

= 30240

HCF = 3

$\therefore \frac{LCM}{HCF} = \frac{30240}{3}$

= **10080**

6. Find the difference between the HCF and LCM of 24, 18 , 20 and 36 **(7marks)**

2	24	18	20	36
2	12	9	10	18
2	6	9	5	9
3	3	9	5	9
3	1	3	5	3
5	1	1	5	1
	1	1	1	1

LCM = 2×2×2×3×3×5

= 360

HCF = 2

∴ 360 – 2 **= 258**

EXERCICE 2

1. Calculate the LCM of 45 and 54 using factor method **(5marks)**
   [270]
2. Find the LCM of 40, 30, 48 and 54 by division method **(5marks)**
   [2160]

UNIT 3 : BASIC OPERATIONS ON FRACTIONS

- Solving fractions of different basic operations

1. Simplify $16\frac{1}{8} + 8\frac{1}{4} \div 3\frac{2}{3}$ **(6marks)**

$16\frac{1}{8} + 8\frac{1}{4} \div 3\frac{2}{3}$

$= \frac{33}{4} \div \frac{11}{3}$

$= \frac{33}{4} \times \frac{3}{11}$

$= \frac{9}{4}$

$= 16\frac{1}{8} + 2\frac{1}{4}$

$= 18 \frac{1 + 2}{8}$

$\mathbf{= 18\frac{3}{8}}$

2. Subtract $\frac{7}{18}$ from t he product of $\frac{5}{12}$ and $1\frac{11}{25}$ **(4marks)**

$= \frac{5}{12} \times 1\frac{11}{25} - \frac{7}{18}$

$= \frac{5}{12} \times \frac{36}{25}$

$= \frac{3}{5} - \frac{7}{18}$

$= \frac{54 - 35}{90}$

$\mathbf{= \frac{19}{90}}$

3. Divide the different between $10\frac{1}{12}$ and $2\frac{7}{8}$ by $\frac{3}{4}$ **(6marks)**

$10\frac{1}{12} - 2\frac{7}{8} \div \frac{3}{4}$

$8 \frac{2 - 21}{24}$

$$7\ \frac{26\ -\ 21}{24}$$

$$7\frac{5}{24}\ \div\ \frac{3}{4}$$

$$\frac{173}{24}\ \times\ \frac{4}{3}$$

$$\frac{173}{18}$$

$$\mathbf{= 9\ \frac{11}{18}}$$

4. Take the product of $2\frac{1}{7}$ and $1\frac{1}{20}$ from the sum of $3\frac{1}{8}$ and $4\frac{1}{5}$ **(5marks)**
[2002 Q.32]

$$3\frac{1}{8}\ +\ 4\frac{1}{5}\ -\ 2\frac{1}{7}\ \times\ 1\frac{1}{10}$$

$$7\ \frac{5\ +\ 8}{40}$$

$$7\frac{13}{40}\ -(\ 2\ \frac{1}{7}\ \times\ 1\frac{1}{10}\ )$$

$$\frac{15}{7}\ \times\ \frac{11}{10}$$

$$\frac{55}{14}$$

$$7\ \frac{13}{40}-\ 3\frac{13}{14}$$

$$4\ \frac{91\ -\ 260}{280}$$

$$3\ \frac{371}{11}-\ 260$$

$= \mathbf{3\frac{111}{280}}$

5. Simplify $\frac{1}{2} + \frac{1}{3}$ of $\frac{1}{4}$ **(4marks) [2003 Q.18]**

$\frac{1}{2} + \frac{1}{3}$ of $\frac{1}{4}$

$\frac{1}{3} \times \frac{1}{4}$

$\frac{1}{12}$

$\frac{1}{2} + \frac{1}{12}$

$\frac{6 + 1}{12}$

$= \mathbf{\frac{7}{12}}$

6. Simplify $\frac{1}{4} \div 3\frac{1}{3} + \frac{1}{8}$ **(4marks) [2004 Q. 5]**

$\frac{1}{4} \div 3\frac{1}{3} + \frac{1}{8}$

$\frac{1}{4} \div \frac{10}{3}$

$\frac{1}{4} \times \frac{3}{10}$

$\frac{3}{40}$

$\frac{3}{40} + \frac{1}{8}$

$$\frac{3 + 5}{40}$$

$$\frac{8}{40}$$

$$= \frac{1}{5}$$

7. Simplify $\frac{5}{2}$ of $(\frac{13}{5} - 1\frac{1}{5} \div \frac{2}{3})$ **{8 marks} [2006 Q.31]**

$$1\frac{1}{5} \div \frac{2}{3}$$

$$\frac{6}{5} \times \frac{3}{2}$$

$$\frac{13}{5} - \frac{9}{5}$$

$$2\frac{3}{5} - 1\frac{4}{5}$$

$$1\ \frac{3 - 4}{5}$$

$$\frac{8 - 4}{5}$$

$$\frac{5}{2} \times \frac{4}{5}$$

$$= 2$$

8. Simplify $2\frac{1}{2} \div 1\frac{1}{4} \times \frac{1}{3}$ **(5marks) [2012 Q.6)**

$$2\frac{1}{2} \div 1\frac{1}{4} \times \frac{1}{3}$$

$$\frac{5}{2} \div \frac{5}{4} \times \frac{1}{3}$$

$$\frac{5}{2} \times \frac{4}{5} \times \frac{1}{3}$$

$$= \frac{2}{3}$$

9. Simplify $2\frac{2}{9} \times (3\frac{3}{4} - 1\frac{5}{8}) \div 1\frac{1}{3}$. **(4marks) [2017 Q.22)**

$2\frac{2}{9} \times (3\frac{3}{4} - 1\frac{5}{8}) \div 1\frac{1}{3}$

$2\ \frac{6-5}{8}$

$2\frac{2}{9} \times 2\frac{1}{8}\ \ 1\frac{1}{3}$

$\frac{20}{9} \times \frac{17}{8} \div \frac{4}{3}$

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$\frac{20}{9} \times \frac{17}{8} \times \frac{3}{4}$

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$\frac{85}{24}$

= $3\frac{13}{24}$

10. Add $4\frac{2}{3}$ to the product of $3\frac{1}{5}$ and $\frac{3}{4}$ **(6 marks) [2015 Q. 23]**

$3\frac{1}{5} \times \frac{3}{4} + 4\frac{2}{3}$

$\frac{16}{5} \times \frac{3}{4}$

$\frac{12}{5} + 4\frac{2}{3}$

$2\frac{2}{5} + 4\frac{2}{3}$

$6\ \frac{6+10}{15}$

$6\frac{16}{15}$

= $7\frac{1}{5}$

11. Tupa , Maria and Mwai shared a sum of money as follows; Tupa got $\frac{1}{2}$ of the money, Maria got $\frac{2}{3}$ of the remainder . How much did Maria get if Tupa got K180. **(5marks)**

If Tupa got K180 as half of the amount

$\therefore$ The amount = $2 \times$ K180

= K360

Maria = $\frac{2}{3}$ of (K360 $-$ K180)

$\frac{2}{3} \times$ K180

= K120 (answer)

Mwai got = K360 – (K120 + K180)

= K60

Tupa got K180 Mwai got K60

Maria got K 120

12. The sum of the ages of yamikani and wongani is $\frac{4}{5}$ of Tamanda's age. If Tamanda is $12\frac{1}{2}$ years old and Yamikani is $2\frac{1}{2}$ years old. How much old is Wongani? **(4marks)**

Yamikani + Wongani = $\frac{4}{5}$ of Tamanda

$$2\frac{1}{2} + W = \frac{4}{5} \times 12\frac{1}{2}$$

$$W = \frac{4}{5} \times 12\frac{1}{2} - 2\frac{1}{2}$$

$$\frac{4}{5} \times \frac{25}{2}$$

$$10 - 2\frac{1}{2}$$

$$8 - \frac{1}{2}$$

$$\mathbf{= 7\frac{1}{2}\ years}$$

13. In a class, $\frac{7}{9}$ of the learners put on shoes. If 16 learners do not put shoes. How many learners are in the class? **(4marks)**

Learners in shoes = $\frac{7}{9}$

Learners not in shoes = $\frac{9}{9} - \frac{7}{9}$

$= \frac{2}{9}$

If $\frac{2}{9} = 16$

$\frac{7}{9}$ = more

$\therefore \frac{7}{9} \div \frac{2}{9} \times 16$

$\frac{7}{9} \times \frac{9}{2} \times 16$

56

Learners in class = 16 + 56

= 72

EXERCISE 3

1. Simplify $11\frac{2}{5} \div 1\frac{7}{12} \times 13\frac{1}{3} + \frac{3}{4} - 1\frac{7}{9}$ **(8marks)** **$\{94\frac{35}{36}$**

2. Simplify $\frac{2}{5} + \frac{7}{9} \times (4\frac{19}{20} \div 19\frac{1}{4} - \frac{1}{5})$ **[8marks]** **$\{\frac{2}{5}\}$**

3. Simplify $(10\frac{1}{2} - 2\frac{7}{8} + 1\frac{11}{12})$ of $1\frac{1}{2} \div \frac{3}{4}$ **[8marks]** **$\{19\frac{1}{12}\}$**

4. Simplify $[1\frac{1}{7} \times (2\frac{1}{2} - \frac{7}{8})$ of $\frac{7}{30}] + \frac{1}{2}$ **[8marks]** **$\{\frac{14}{15}\}$**

5. Simplify $14\frac{2}{3} - 6\frac{1}{2} - 3\frac{1}{4} \div 3\frac{5}{7}$ **(6marks)** **[$7\frac{7}{24}$]**

6. By how much is the quotient of $3\frac{1}{4}$ and $3\frac{3}{7}$ less than the difference between $6\frac{1}{2}$ and $14\frac{2}{3}$ (5marks) **[$7\frac{7}{24}$]**

7. Simplify $\frac{4}{5} \times 12\frac{1}{2} - 2\frac{1}{2}$ (5marks) **[$7\frac{1}{2}$]**

UNIT 4 : DECIMALS

Decimal's place value guide: TTh Th H T O . t h th

e.g, (i). write 185.02 in their place values =

TTh	Th	H	T	O	.	t	h	th
		1	8	5	.	0	2	

(ii). Find the sum of 127.45 and 1.580 =

TTh	Th	H	T	O	.	t	h	th
	1	2	7	.	4	5		
+			1	.	5	8	0	
1	2	9	.	0	3	0		

1. Add together 500.06, 76.7, 9.048, 567.6 **(3marks)**

$$\begin{array}{r} 500.06 \\ 76.7 \\ + \quad 9.048 \\ \underline{\quad 567.6} \\ \underline{1153.408} \end{array}$$

2. Subtract 832.6547 from 2563.13 **(2marks)**

$$\begin{array}{r} 2563.13 \\ - \ \underline{832.6547} \\ \underline{1730.4753} \end{array}$$

3. A drum contains 114l of water. Later , 72.5l of water were poured into it. How much water remained in the drum if 91.8l were used for washing clothes **(3marks)**

114.0l
+ 72.5l
186.5l
−91.8l
94.7l

4. By how much does the sum of 25.04 and 96.75 exceed 72.5 **(3marks)** **[2011 Q.2]**

25.04
+ 96.75
121.79
−72.5
49.29

5. Water flows from a pipe at the rate of 4.4408 litres per minute. How long will it take to fill 3.5 tank of capacity 92.952 litres each?(Correct to 2 decimal places) [5marks)

If 4.4408l = 1min
92.952l= more
$\therefore \frac{92.952l \times 1min}{4.4408l}$
$\frac{92952 \times min}{44408}$
= 20.93 min
If 1l tank = 20.93 min
3.5l tank = more
$\therefore \frac{3.5l \times 20.93}{1l} = 73.255$
= 73.26min
(2dp)

6. Simplify $(0.112 \div 5.6) \times 4.2$

$(0.112 \div 5.6) \times 4.2$
0.02×4.2
= 0.084

7. A trader had 260.9 litres of cooking oil. She sold 87.8 litres to a vendor. If the remaining oil was sold at K520.80 per litre. How much money did she make from the remaining cooking oil **(4marks)**

260.9l
+ 87.8l
173.1l

If 1l = K520.80t
173.1l = more

$\therefore \frac{173.1l \times K520.80}{1l}$

= K90150.48

8. Simplify 0.12 – 0.02 × 0.65 **(4marks) [2012 Q.21]**

0.65
× 0.02
130
000
000
0.0130

0.12
− 0.1030
0.1070

9. Add 84.04, 22, 0.55 and 8 **(3marks) [2017 Q. 1]**

84.04
22.00
0.55
+ 8.00
114.59

10.Simplify $3.2 + 4.65 \div 1.5$ **(3marks) [2014 Q.1]**

$(4.65 \div 1.5) + 3.2$

$3.1 + 3.2$

= 6.3

11.Simplify $\frac{0.6 \times 0.8}{1.12}$ **(4marks) [2013 Q. 9]**

0.6×0.8

$\frac{0.48}{0.012}$

$\frac{480}{12}$

= 40

12.Write 17.025 as a mixed number in its lowest term **(3marks)**
(2009 Q.1)

$\frac{025}{100}$

$\frac{1}{4}$

= $17\frac{1}{4}$

13.Simplify $(0.112 \div 5.6) \times 4.2$ **(3marks) [2007 Q.4]**

$(0.112 \div 5.6) \times 4.2$

0.02×4.2

=0.084

14. Change 7.35 km to m **(3marks)**

If 1km = 1000m

7.35km = more

$\therefore \frac{7.35\text{km} \times 1000\text{m}}{1\text{km}}$

$(7.35 \times 1000)\text{m}$

= 7350m

15. Change K127 49t to decimal notation **(2marks)**

K127.49t

$K\frac{12740}{100}$

= K127.49

EXERCISE 4

1. Multiply 0.0469 by 48 (3marks)
2. What is the product of 482.034 and 63.56 (3marks)
3. Divide the quotient of 5972.46 and 46.5 by 4
4. By what must 0.006 be multiplied to give 0.048144 (4marks)
5. The area of a rectangle is 771.043m^2 and the length is 32.06m. Find its width (4marks)
6. A hotel buys 87.045 kg of meat in a day. How much does it buy in 36 weeks (5marks)
7. Write 3.125 as a mixed number in its lowest term (3marks)

UNIT 5: APPROXIMATION AND ESTIMATION

1. Correct 69.999 to 1 decimal places

   69.9/99

   = 70

1. Correct 0562.09021 to 1 decimal places

   0562.0/9021

   = 562.1

2. Express 0.0615 to 2 decimal places

   0.06/15

   = 0.06

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3. Express 145.52456 to 3 decimal places

   145.524/56

   = 145.525

4. Express 0.003810 to 3 decimal places

   0.003/810

   = 0.004

5. Express 80.045 as a mixed number

   80.045

   $80\frac{45}{1000}$

   $= \mathbf{80\frac{9}{200}}$

6. Write 30.002 as a mixed number

30.002

$30\ \frac{2}{1000}$

$\mathbf{= 30\frac{1}{500}}$

7. Write 44.7 to the nearest 10

44.7

= 45

8. Express 59 to the nearest 10

59

= 60

9. Write 911 to the nearest 100

911

= 900

10. Write 46,412 to the nearest 1000

46,412

= 46,000

11. Express 1549 to the nearest 100 (2014 Q8)

1549

= 1500

12. Divide 784 by 10 giving your answer correct to the nearest whole number

$784 \div 10$

78.4

= 78

13. Express 198059 to the nearest hundred

198059

= 198100

14. Express 12.86403 to nearest whole number

12.86403

= 13

15. Correct 86943.5452 to the nearest tenth

86943.5/452

= 86943.5

16. Correct 22.2333 to the nearest hundredth

22.23/33

= 22.23

17. Find the area of a square whose side is 34.06, giving your answer correct to the nearest cm^2 (square centimeter)

Area of a square = S × S

(34.06 × 34. 06) cm^2

1160.0836

= 1160cm^2

18. Express 0.1451 to 2 significant figures (2004 Q.2)

0.1451

= 0.15

19. Express 3.0552 to 2 significant figures (2010 Q.2)

3.0552

= 3.1

20. Write 0.0798 to 2 significant figures (2011 Q.10)

0.0798

0.08

21. Write 0.120532 to 3 significant figures

0.120532

= 0.121

22. Express $\frac{5}{7}$ as decimals and correct to 4 places

$7 \div 5 = 0.71428$

0.7142/8

= 0.7143

EXERCISE 5

1. Write 710278 to 4 significant figures
2. Express 46.78543 to 4 significant figures
3. Express 90.34623m to 4 decimal places
4. Write 109.5462 to 2 decimal places
5. Express 276.206 to the nearest whole number
6. Express 8973.67 to the nearest whole number
7. Express 0.941 to 1 decimal places
8. Express $\frac{30}{7}$ as decimals and correct to four places

UNIT 6: RATE

1. The cost of travelling by coach from Blantyre to Lilongwe is K4800.if the distance between Blantyre and Lilongwe is 300km,what is the cost of the journey per km. (4marks)

Distance = 300km

Cost = K4,800

If 300km = K4,800

1km = less

$\therefore \frac{1\text{km} \times \text{K4,800}}{300\text{km}}$

= K16

2. John is paid K10, 000 for working for 3 hours. What is his pay rate per hour? **(3 marks)**

   If 3hrs = K10,000

   1hr = less

   ∴ $\frac{1\text{hr} \times \text{K10,000}}{3\text{hrs}}$

   = K3333.33

3. The distance covered by a cyclist from town A to town B is 217km. Find the speed if 7 hours was taken to cover the distance. (5marks)

   Distance = 217km
   Time = 7 hrs

   Speed = $\frac{\text{Distance}}{\text{Time}}$

   $\frac{217\text{km}}{7\text{hrs}}$

   = 31km/hr

4. A lorry covers a distance of 600km in 8 hours. A car covers the same distance in 5 hours. Calculate the difference in speed. **(5marks)**

   a. The speed of the lorry and the car

      Speed for a lorry = $\frac{\text{Distance}}{\text{Time}}$

$$= \frac{600\text{km}}{8\text{hrs}}$$

= 75km/hr

$$\text{Speed of a car} = \frac{600\text{km}}{5\text{hrs}}$$

= 120km/hr ∴ difference = (120 − 75) km/hr **= 45km/hr**

b. The time each of the two vehicles arrived if both of them started off at 6 o'clock in the morning. (3marks)

Time the lorry arrived = 6:00am + 8hrs

= 2:00pm (14:00)

Time a car arrived = 6:00 + 5hrs

= 11:00am

5. A cyclist moves a distance of 21km from Bwandilo to crossroad hotel . Calculate time if 5km/hr was used. (4marks)

Distance = 21km
Speed = 5km/hr

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Time} = \frac{21\text{km}}{5\text{km/hr}}$$

= 4hrs 2min (4.2hrs)

6. A minibus takes $2\frac{1}{2}$ hours to travel from a town to a village at the speed of 50km/hr. how far is the village from the town? (4marks)

Time = $2\frac{1}{2}$ hrs

Speed = 50km/hr

Distance = Speed × Time

$$\frac{\mathbf{50}\boldsymbol{km}}{\boldsymbol{hr}} \times \frac{\mathbf{5}\boldsymbol{hrs}}{\mathbf{2}}$$

= 125km

7. A train covers a distance of 266.5 km between 8.30am and 11.45am. Find its speed in km/hr. (5marks)

Time from 8:30 to 11:45am

= 3hrs 15min

= $3\frac{1}{4}$ hrs

If $3\frac{1}{4}$ hrs = 266.5km

1 hr = less

$$\therefore \frac{533}{2} \div \frac{13}{4}$$

$$\frac{\mathbf{533}}{\mathbf{2}} \times \frac{\mathbf{4}}{\mathbf{13}}$$

Speed **= 82 km/hr**

8. Express 80 km/hr in m per second. (3marks)

In 1minute car travels = $\frac{80\ km}{60}$

In 1 sec car travlels = ($\frac{80}{60} \times \frac{1000}{60}$)

= $\frac{200min}{9\ sec}$

$= 22\frac{2}{9}$ min/sec

$\therefore$ Speed is $22\frac{2}{9}$ min/sec

9. A minibus left Blantyre at 11.30am and reached Dedza at 3.00pm on the same day. If it was travelling at an average speed of 60km/h, calculate the distance covered. **(5marks) {2017 Q.25 repeated 2006 Q.33)**

Speed = 60 km/hr
Time = From 11:30am to 3:00pm (3hrs 30min)
$= 3\frac{1}{2}$ hrs
$\therefore$ Distance = Speed $\times$ Time

$= \frac{60km}{hr} \times \frac{7hr}{2}$

= 210km

10. Mary goes to a school that starts at 7:30am. One day she arrived at the school 35 minutes late. At what time did she get there**? (3marks) {2012 Q.15)**

Starting time = 7:30am
Arrival time = 7:30 + 35min
= 8:05am

11. A bus left Majiga at 7:30 am and reached Dziwe at 10:30 am. If it was travelling at an average speed of 90 km/h, what distance did it cover? **(4 marks) {2010 Q.12)**

Time = From 7:30am to 10:30am
= 3hrs
Speed = 90km/hr

Distance = Speed × Time

= 90km/hr × 3hrs

= 270km

12. A minibus left Blantyre at 11:30 am and reached Dedza at 3:00 pm on the same day .if it was travelling at an average speed of 60km/h, calculate the distance covered. **(6 marks) (2006 Q. 33)**

Time = From 11:30 to 3:00

= 3hrs 30min

= $3\frac{1}{2}$ hrs

Distance = Speed × Time

= $\frac{60km}{hr} \times \frac{7hrs}{2}$

= 210km

13. Two cars leave Blantyre for Lilongwe at the same time, one via Zalewa a distance of 360km and the other via Zomba a distance of 420km. If both cars are travelling ta an average speed of 120km/h, what will be the time difference in arrival? **(5 marks) {2003 Q.32b)**

I. A car via Zalewa

Speed = 120km/hr

Distance = 360km

Time = Distance / Speed

= 360km / 120km/hr

= 3hrs

II.A car via Zomba

Time = $\frac{420km}{120km/hr}$

= 3hrs 5min

Time difference =(3hrs 5min – 3hrs)

= 5min

I. A cyclist left his home at 9:00 am for the market travelling at a speed of 24 km/hr. He rested $1\frac{1}{2}$ hours and continued with the journey at the same speed. If eh reached the market at 3:00pm, calculate the total distance travelled. **(5 marks) [2005 Q.32]**

Time = From 9:00 am to 3:00pm

=6hrs

Real time of the journey = $(6 - 1\frac{1}{2})$ hrs

= $4\frac{1}{2}$ hrs

∴ Distance = Speed × Time

$=\frac{24km}{hr} \times 4\frac{1}{2}\ hrs$

$=\frac{24km}{hr} \times \frac{9}{2}$ hrs

= 108km

EXERCISE 6

1. A bus travel from 8:00am to 3:00pm a distance of 520km. How long does it take if it stopped for 30 minutes to reach the destination? **(4 marks**)
2. If a man walks 5km in 40 minutes, find his rate of walking in km/hr. **(3 marks)**
3. If a car travels 30km in 15 minutes, and a bus travels 35km in 20 minutes,. Find their difference in km per minutes. **(4 marks)**

UNIT 7: RATIO AND PROPOTION

1. Express 86l to 258l to its lowest form **(2 marks)**

   Ratio = 86: 258

   = 1: 3

2. There are 8 teachers and 376 learners at a school. Find the ratio of teachers to their learners in its simplest form. **(2 marks) (2012 Q.4)**

   Ratio = teacher: learners

   = 8:376

   =1:47

3. Increase K780 .72 in the ratio 7:4 **(3 marks)**

   $= \frac{7}{4} \times$ K780.72

   $=7 \times$ K195.18

   = K1366.26

4. Decrease K45,500 in the ratio of 2:5 **(3 marks)**

   $= \frac{2}{5} \times$ K45,500

   $= 2 \times$ K9100

   = K18,200

5. A certain sum of money is shared among three students in the ratio 2:3:5, If the least got K12.00. How much was the sum altogether. **(4 marks)**

   Ratio = 2:3:4

   Least share = K12.00

   Total ratio = 2+ 3+4

   = 9

   If 2 = K12.00 (least)

   9 = more

$\therefore \frac{9}{2} \times 12.00$

$= 9 \times 6$

= K54 (total amount)

6. A certain amount of money was shared among three children in ratio 2:3:5. If the least got K3, 000.00. Calculate the total amount. **(5marks) [2012 Q.27]**

Ratio = 2:3:5

Total ratio = 2+3+5

= 10

If 2 = K3, 000 (least)

10 = more

$\therefore \frac{10}{2} \times$ K3, 000

$= 10 \times$ K1, 500

= K15, 000

7. A carton contains guavas and mangoes in the ratio 5:2 respectively. If the carton contains 140 guavas, calculate the number of mangoes in the carton. **(5 marks) [2008 Q.5]**

If 5 = 140 (guavas)

2 = less (mangoes)

$\therefore$ Mangoes $= \frac{2}{5} \times 140$

$= 2 \times 28$

= 56 mangoes

or

Total ratio = 5 + 2

= 7

If $\frac{5}{7} = 140$

$\frac{2}{7}$ = less

$\therefore \frac{2}{7} \div \frac{5}{7} \times 140 = \frac{2}{7} \times \frac{7}{5} \times 140$

$= 2 \times 28$

= 56 mangoes

8. Three children like rice and two others like nsima. What is the ratio of children who like nsima to those who like rice? **(2 marks)**

Ratio = nsima : rice

= 2 : 3

9. If the ratio of boys to girls in class is 3:4, what is the ratio of girls to boys? **(2 marks)**

Ratio = girls : boys

= 4:3

10. A clock loses 4 minutes each week. How many minutes would it lose in 21 days **(4marks)**

1 week = 4 mins

If 7 days = 4 mins

21 days = more

$\therefore \frac{21}{7} \times 4$ mins

=(3 × 4) mins

= 12 minutes

A car uses 6 litres of petrol for a distance of 120 kilometres. How many litres of petrol would be needed for a journey of 80 kilometres. **(4 marks)**

If 120 km = 6 litres

80 km = less

$\therefore \frac{80km}{120km} \times 6$ lites

$= \frac{80}{20}$ litres

= 4 liters

12,Tadala shared sweets to Taonga and Upile in the ratio of 5:7. If Upile got 42 sweets. How many sweets were there altogether? **(5 marks)**

Ratio = 5:7

Total ratio = 5 + 7

= 12

If 7 = 42 sweets

12 = more

$\therefore \frac{12}{7} \times 42$ sweets

= (12 × 6) sweets

= 72 sweets

A bed and a table costs K3, 000. A bed costs twice as much as a table. How much does each cost? **(5 marks)**

Ratio = bed : table

= 2:1

Total ratio = 2+1

= 3

∴ a bed costs = $\frac{2}{3} \times$ K3, 000

= K (2 × 1,000)

= K2, 000

A table costs = $\frac{1}{3} \times$ K3, 000

= K1, 000

11. A certain sum of money is shared among three students in the ratio 2:3:5. If the least got K4,500, how much was the sum together? **(5 Marks)**

Ratio = 2:3:5

Total ratio = 2 + 3 + 5

= 10

If 2 = K4, 500 (least)

10 = more

∴ $\frac{10}{2} \times$ K4, 500

= 5 × K4, 500

= K22, 500

12. Three farmers put together money in the ratio 2;3:4 to buy fertiliser. Calculate the bags of fertilisers each farmer received, if they bought 486 bags. **(7 marks)**

Total ratio = 2 + 3 + 4

= 9

1st farmer = $\frac{2}{9} \times$ 486 bags

= (2 × 54) bags

= 108 bags

2nd farmer = $\frac{3}{9} \times 486$ bags

= (3 × 54) bags

=162 bags

3rd farmer = $\frac{4}{9} \times 486$ bags

= (4 × 54) bags

= 216 bags

13. Takondwa and chikondi shared sweets in the ratio 5:7. If chikondi got 42 sweets, how many sweets did Takondwa get? **(5 marks) [2014 Q. 12)**

Total ratio = 5+7

= 12

If 7 = 42 sweets (chikondi)

12 = more

∴ $\frac{12}{7} \times 42$ sweets

= (12 × 6) sweets

= 72 sweets

14. Buthu , Mwali and Baba together bought a sewing machine at K3960. If they contributed money in the ratio 4:7:9, how much did Mwali pay? **(3marks)**

Total ratio = 4 + 7 + 9

= 20

Mwali = $\frac{7}{20} \times$ K3, 960

= K (7 × 198)

= K1, 386

15. Simplify the ratio, $2\frac{1}{4} : 4\frac{1}{2}$ in its simplest form. (4 marks) **[2003 Q.35 b)**

Ratio = $2\frac{1}{4} : 4\frac{1}{2}$

$= \frac{9}{4} : \frac{9}{2}$

$= 4 \times \frac{9}{4} : \frac{9}{2} \times 4$ (multiply both side by the LCM of 4 and 2 which is 4)

= 9 : 18

= 1 : 2

16. Three people shared 370 mangoes in the ratio $\frac{1}{2} : \frac{3}{8} : \frac{2}{3}$. How many mangoes does each person get? **(7 marks)**

Ratio = $24 \times \frac{1}{2} : 24 \times \frac{3}{8} \times \frac{2}{3} \times 24$ (multiply both sides by the LCM 24)

= 12 : 9 : 16

Total ratio = 12 + 9 + 16

= 37

1st person = $\frac{12}{37} \times 370$

= 12 × 10

=120

2nd person = $\frac{9}{37} \times 370$

= 9 × 10

= 90

3rd person = $\frac{16}{37} \times 370$

= 16 × 10

= 160

17. If 2 people can dig a pit latrine in 180 hrs. Find the number of people who can dig 11 pit latrines at the same rate. **(4 marks)**

Ratio = pit latrines : people
= 1: 2
If 1 pit = 2 people
11 pits = more
$\therefore \frac{11}{1} \times 2$ people
= (11 × 2) people
= 22 people

18. Three brothers share K5, 400 such that the youngest gets 45% of the amount; the elder one gets 60% of the remainder. How much does the eldest brother get? **(5 marks)**

The youngest = $\frac{45}{100} \times$ K5, 400
= K (45 × 54)
= K2, 430
The remainder = K5, 400 – K2, 430
= K2, 970
$\therefore \frac{60}{100} \times$ K2, 970
= K (6 × 297)
= K 1, 782

19. A school has enough food to feed 540 pupils for 15 days. Find the number of pupils who can feed on the same amount of food for 20 days at the same rate? **(4 marks)**

Ratio = days: pupils
= 15: 540
If 15 days = 540 pupils
20 days = more
$\therefore \frac{20 \text{ days}}{} \times 540$ pupils

15 days

= (20 × 36) pupils

=720 pupils

20. A garden was to be prepared by 24 people in 30 days. After working for 10 days, 14 men left. How long would the remaining people take to complete the garden? **(6 marks) [2010 Q. 29)**

24 people = 10 days

Remaining people = (24 – 14) people

=10 people

If 24 people = 10days

10 people = more

$\therefore \frac{24}{10} \times 20$ days (remaining days)

= (24 × 2) days

= 48 days

21. Chimwemwe is twice as much as Mphatso. If the sum of their ages is 36 years, find the age of Chimwemwe. **(5 marks) [2015 Q.28)**

Ratio = Chimwemwe : Mphatso

= 2:1

Total ratio = 2+1 = 3

Chmwemwe = $\frac{2}{3} \times 36$ ages

= (2 × 12) ages

= 24 ages

22. A lady spends $\frac{2}{5}$ of her salary on food, $\frac{1}{6}$ on house rent and the remaining K26,000 on clothes. Calculate her monthly salary. **(5marks)** **2018 Q.26**

Money spent on food and rent

$= \frac{2}{5} + \frac{1}{6}$

$\frac{12 + 5}{30}$

$= \frac{17}{30}$

The remaining on clothes $= \frac{30}{30} - \frac{17}{30}$

$= \frac{13}{30}$

If $\frac{13}{30}$ = K26,000

$\frac{30}{30}$ = more

$\therefore \frac{30}{30} \div \frac{13}{30} \times$ K26,000

$= \frac{30}{30} \times \frac{30}{13} \times$ K26,000

= K60, 000

EXERCISE 7

1. Wongani and Thoko shared oranges in the ratio $2\frac{1}{4} : 4\frac{1}{2}$. How many oranges did the largest get if there are 240 oranges?
2. A pencil and a book cost K720. A book costs eight times as much as a pencil. How much does each costs.
3. Chimwemwe , Chifundo and Mphatso shared 110 sweets, for every 2 sweets Chimwemwe gets, Chifundo gets 3 and Mphatso gets 5. How many sweets did each receive?
4. If a person can build a fence in 4 days. How long can 12 people take to build the same fence?

If 30 pupils can do a piece of work in 12 hours, calculate the number of pupils that are needed to do the same work in 18 hours, at the same rate.

5. Mphatso , Upile and Chikondi had 16, 12 and 8 goats respectively. If these goats were looked after by one boy who received a salary of K846 per month, how much did Upile contribute **(2003 Q. 16)**

UNIT 8 : PERCENTAGES

1. Express $8\frac{2}{3}$ as a percentage (4 marks)

   $8\frac{2}{3} = \frac{24}{3}$

   $= \frac{26}{3} \times 100\%$

   $= \frac{2600}{3}\%$

   $= 866\frac{2}{3}\%$ or 866.67% (2 dp)

2. Express 99% as a decimal (2 marks)

   $99\% = \frac{99}{100}$

   = 0.99

3. Express 0.008 as a percentage (3 marks)

   0.008 = 0.01 to 2 decimal places

   $= \frac{1}{100} \times 100\%$

   = 1%

4. Express 2.83 as a percentage (3 marks)

   $2.83 = 2\frac{83}{100}$

   $= 2\frac{83}{100} \times 100\%$

   $= (2 + 83)\ \%$

   $= 85\%$

5. Chisomo scored 90% in maths test. If the test was marked out of 20, what marks did Chisomo get? (3 marks)

   $90\% = \frac{90}{100}$

   $\text{Marks} = \frac{90}{100} \times 20$

   $= (2 \times 9)$ marks

   = 18 out of 20

6. A well is $3\frac{1}{2}$ m deep. If it has water up to the depth of 1.75m. What percentage of the well holds water? **(3 marks**)

   Depth of well holds water = 1.75m

   $= 1\frac{75}{100} \times 100\%$

   $= (1 + 75)\ \%$

   =76%

7. Express 3:40 as percentage. **(3 marks)**

   $3{:}40 = \frac{3}{40}$

   $= \frac{3}{40} \times 100\%$

   $= (3 \times 2.5)\ \%$

   = 7.5%

8. Increase 700 by 11%. (3 marks)

   $= 700 + (11\%\ \text{of}\ 700)$ **or** $700 \times (11\% + 100\%)$

$= 700 + \frac{11}{100} \times 700$ $= 700 \times \frac{111}{100}$

$= 700 + 77$ $= 7 \times 111$

= 777 **= 777**

9. Increase 88 by 200%. (3 marks)

$= 88 + (200\% \text{ of } 88)$

$= 88 + \frac{200}{100} \times 88$

$= 88 + 176$

= 264

10. Decrease 120 by 5%. (3 marks)

$= 120 - (5\% \text{ of } 120)$ or $= 120 \times (100\% - 5\%)$

$= 120 - \frac{5}{100} \times 120$ $= 120 \times \frac{95}{100}$

$= 120 - 6$ $= 6 \times 19$

= 114 **= 144**

11. Decrease 30 by 10%. (3 marks)

$= 30 \times (100\% - 10\%)$

$= 30 \times \frac{90}{100}$

$= 3 \times 9$

= 27

12. In a school there are 300 girls and 200 boys. Find :

a. The ratio of girls to boys (2 marks)

Ratio = girls: boys

= 300:200

= 3:2

b. The percentage of girls in the school (3 marks)

Total ratio = 3 + 2

= 5

Percentage = $\frac{3}{5} \times 100\%$

$= (3 \times 20)\ \%$

= 60%

13. The value of a Sofa set went down by 12% to K132 000 after one year. Find the original value of the Sofa set. (4 marks) [2017 Q.27a)

Discount = (100 – 12) %
=88%
If 88% = K132 000
100% = more (original price)
$\therefore \frac{100}{88} \times$ K132 000
= K (100 × 1500)
= K150 000

14. Express $\frac{1}{3}$ as a decimal number, correct to 3 decimal places **(3 marks) [2014 Q.13)**

$\frac{1}{3}$ = 0.3333
0.3333 (3 decimal places)
= 0.333

15. Chifundo scored 80% in a test. If the test was marked out of 20, calculate Chifundo's actual score. **(4 marks) [2014 Q.14)**

Total marks = 20
Chifundo = $\frac{80}{100} \times 20$
= 8 × 2
= 16

16. A school has 800 learners; 25% are girls. If 75% of the girls stay at the boarding, find the number of girls who do **not** stay at the boarding. **(5 marks) [2013 Q.29b]**

Number of girls at school = $\frac{25}{100} \times 800$
= (25 × 8) girls

= 200 girls

Girls stay at boarding = $\frac{75}{100} \times 200$

= 150 girls

∴ Girls do not stay at boarding = 200 – 150

= 50 girls

17. Fire destroyed 96% books in a library. If 200 books were not burnt, calculate the original number of books in the library**. (4 marks) [2012 Q.11]**

Books not burnt = (100 – 96) %

= 4%

If 4% = 200 books

100% = more (original number of books)

∴ $\frac{100}{4} \times 200$ books

= (100 × 50) books

= 5 000 (books in the library)

18. The price of fuel has increased by 15%. If the original price was K150.00 per litre, calculate the new price for 2 litres**. (5 marks) [2009 Q. 2)**

= K150 × (100% + 15%)

= K150 × 115%

= K150 × $\frac{115}{100}$

= K $\frac{345}{2}$

= K 172.50 (for 1 litre)

∴ 2 litres = K172.50 × 2

= K345.00

19. Joyce scored 19 out of 25 in English while Dina scored 14 out of 25. Calculate the difference between their scores in percentages. **(4 marks) [2009 Q.11]**

Joyce = $\frac{19}{25} \times 100\%$

$= (19 \times 4)\ \%$

$= 76\%$

Dina = $\frac{14}{25} \times 100\%$

$= (14 \times 4)\ \%$

$= 56\%$

$\therefore$ Different in percentages = $76\% - 56\%$

= 20%

20. During a one hour radio programme there were 18 minutes of talking and the rest was music. What percentage of the programme was music. **(4 marks) [2007 Q.17)**

Talking = 18 min

Music = (60 – 18) min

= 42 min

Percentage = $\frac{42\text{min}}{60\text{ min}} \times 100\%$

$= (7 \times 10)\ \%$

= 70%

EXERCISE 8

1. Change $4\frac{5}{7}$ to an improper fraction **[2017 Q.5]**
2. A district has 94 0000 people. If the population increased at the rate of $4\frac{1}{2}\%$ per year, calculate the number of people after 6 month. **(2007 Q. 7)**
3. In 1999, a farmer sold his crops amounting to K36 000. In the following year, the sales increased by 10%. How much did the farmer get in 2000? **(2006 Q.11**)
4. By what percentage should 460 be increased to give 483? **(2006 Q.28)**
5. The pass rate at a certain school decreased by 5%. If in the previous year 60 learners passed, how many learners passed in the following year?
6. A shopkeeper offered a discount of 20% for goods worthy K10 000.00. How much did the customer pay?

UNIT 9: MONEY

This unit involves converting Malawi kwacha to any foreign currency and foreign currency to Malawi kwacha using the exchange rate table provided. Converting Malawi Kwacha to foreign currency the selling rate is utilised on the table whereas foreign currency to Malawi Kwacha buying rate is used.

Exchange rate table

Currency	Buying	Selling
US Dollar ($)	K 139.10	K 141.89
British pound (£)	K 282.95	K294.27
SA Rand (R)	K 18.80	K19.74
Euro (E)	K223.47	K232.40
Botswana (P)	K 21.74	K22.24

1. Madalo used $\frac{1}{2}$ of his money to buy pounds. How much money in pounds (£) did he get if he had K385, 493.70? (3 marks)

   Rate = K294.27
   If K294.27 = £1
   K385, 493.70 = more
   ∴ $\frac{\text{K385,393.70}}{\text{K294.27}} \times$ £1
   = £1310

2. Chimwemwe had K464, 859. She used K25, 000 for transport and changed the remaining to US Dollar. How much money in US Dollar ($) did she get? **(4 marks**)

   Remaining amount = K464, 859 – K25, 000
   = K439, 859
   Rate = K141.89
   If K141.89 = 1$
   K 439,859 = more
   ∴ $\frac{\text{K439, 859}}{\text{K141.89}} \times$ 1$
   = $3100

3. Chance sent K382, 551 to his mother who is in Britain, $\frac{1}{3}$ of the amount was used as a processing fee for sending the money. How many pounds (£) did she receive? (correct to the nearest whole number) **(4 marks)**

   Amount converted = $\frac{1}{3} \times$ K382,551
   = K127, 517
   If K294.27 = 1£
   K127, 517 = more
   ∴ $\frac{\text{K127,517}}{\text{K294.27}} \times$ 1£

= £433.3333

= £433

4. Takondwa gave $\frac{1}{4}$ of $680 to Tawina. What is the Kwacha value of the remaining Dollars **(4marks**)

Remaining dollar = $\frac{1}{4} \times \$680$

= $170

Rate = K139.10

If $1 = K139.10

S170 = more

$\therefore \frac{\$170}{\$1} \times K139.10$

= 170 × K139.10

= K23, 647

5. Mary changed £220 to Kwacha and used K21, 200. How much did she remain with? **(4 marks**)

Rate = K282.95

If £1 = K282.95

£220 = more

$\therefore \frac{£220}{£1} \times K282.95$

= K 62, 249 – K21, 200

= K41, 049

6. Tinyade had 3490 Pula. She used 1450 Pula to buy goods. What is the Kwacha value of the remaining Pula? **(4 marks)**

Remaining pula = 3490 pula – 1450pula

= 2040 pula

Rate = K21.74

If 1 pula = K21.74

2040 pula = more

$\therefore \frac{2040 \text{ pula}}{1 \text{ pula}} \times K21.74$

= K44, 349.60

7. A parent received 40 USA dollars from a son and 50 rands from a daughter. How much in Malawi Kwacha did the parent receive? **(6marks) [2011 Q.26]**

Use the exchange rate as on 15/05/08

Currency	**Buying**	**Selling**
USA dollar	K139.10	K141.89
Rand	K18.80	K19.74

From Son = $40

Rate = K139.10

If $1 = K139.10

$40 = more

$\therefore \frac{\$40}{\$1} \times K139.10$

= K5, 564.00

From Daughter = R50

Rate = K18.80

If R1 = 18.80

R50 = more

$\therefore \frac{R50}{R1} \times K18.80$

= K940.00

Total amount = K (5,564.00 + 940.00)

= K6, 504

8. Chikondi bought a bicycle in South Africa worth 500 rands. If one rand is equivalent to K19.74, what is the value of the bicycle in Malawi Kwacha? **(4 marks) [2010 Q.8]**

Rate = K19,74

Amount = R500

If R1 = K19.74

R500 = more

$\therefore \frac{R500}{R1} \times K\ 19.74$

= K9, 870

9. A girl gave $\frac{3}{4}$ of $600 to her brother. What is the value of the remaining dollars in Malawi Kwacha? ($1 = MK 700) **(4 marks) [2017 Q.14)**

Remaining dollar = $\frac{3}{4} \times \$600$

= $450

If $1 = K700

$450 = more

$\therefore \frac{\$450}{\$1} \times K700$

= K315, 000

10. A business man browsed a car on internet worthy 1,500 dollars; he sent an extra 700 dollars for shipping. How much in Malawi Kwacha did he pay to access the car, if 1 dollar is equivalent to K950? **(5 marks)**

Rate = K 950

Total amount converted = $ (1,500 + 700)

= $2, 200

If $1 = K950

$2, 200 = more

$\therefore \frac{\$2,\ 200}{\$1} \times K950$

= K (2,200 × 950)

= K2, 090,000

EXERCISE 9

1. Bertha bought a fridge from South Africa worthy K250, 000 and she was given a transport K12,500 to get the fridge from Lilongwe to Karonga. How many rands used to buy the fridge, if 1 rand is equivalent to K500?
2. How much money in Euro can a Malawian buy with K732, 060.
3. Convert K 21,950.88 to Pula.
4. A television screen costs R2, 150 in South Africa. How much is it in Malawi Kwacha?
5. A business man had 320 Pounds, 670 Dollars and 1,200 Pula. He converted them to Malawi Kwacha. How much money in Malawi did she get altogether?

UNIT 10: BILLS AND BUDGETS

1. Mr Banda had K15,000. He used some to buy 5kg of sugar at K130 per kg, 3 bags of charcoal for K2500, 40 chambo fish at K2320 per unit, and used the balance to pay for his electricity bill. How much was used to pay the electricity bill? **(6 marks)**

5 kg of sugar at K130 per kg = 5 × K130 = K 650.00
3 bags of charcoal for K2,500 + = K 2,500.00
40 chambo fish at K2,320 per unit = 40 × K2320 ÷ 10 =K 9,280.00
Total bill = K 12,430.00

∴ The balance = K15, 000 – K12, 430
= K2, 570

2. Calculate the cost of the following items
   10 tomatoes at 2 for K50
   3 books for K500
   9 bunches of onion at K175 per 3 bunches
   140 units of books at K99 per unit **(5 marks)**

Calculations

10 tomatoes at 2 for K50 = 10 ÷ 2 × K50 = K 250.00
3 books for K500 = K 500.00
9 bunches of onion at K175 per 3 bunches =9 × K175 ÷3=K 525.00
140 units of books at K99 per unit = 140 × K99 ÷ 10 = K 1386.00
Total bill = **K2,661.00**

3. A lady bought the following item from a shop
   75cm cloth at K 120 per metre
   2 units pens at K15 per pen
   7 shirts for K4500
   How much change did she get from K6,000.00 (8 marks) **[2006 Q.32)**

Calculations

75cm cloth at K120 per metre = $\frac{75cm}{100cm} \times$ K120 = K 90.00

7 shirts for K4 500 = K4500.00

2 units pens at K15 per pen = 2 × 10 × K15 = K 300.00

Total bill = K4890.00

∴ The change = K6 000 – K4 890

= K1 110

4. Tina bought a dress at K3500. Zione made a similar dress from 2 metres piece of cloth at K750 per metre, 6 buttons at 3 for K100 and thread for K60. How much did Zione save? **(5 marks) [2013 Q.27]**

Calculations

2 metres of cloth at K750 per metre = 2 × K750 = K 1 500.00

6 buttons at 3 for K100 = $\frac{6}{3} \times$ K100 = K 200.00

A thread for K60 = K 60. 00

Total bill = K 1 760.00

∴ Amount saved = K3500 – K1760 **= K1740.00**

5. Mphatso bought 5 metres of cloth at K750 per metre, 18 bananas at 3 for K100 and $3\frac{1}{2}$ kg rice at K480 per kg. prepare a bill for Mphatso. **(5 marks) [2017 Q. 24)**

Calculations

5 metres of cloth at K750 per metre = 5 × K750 = K 3 750.00

18 bananas at 3 for K100 = $\frac{18}{3} \times$ K100 = K 600.00

$3\frac{1}{2}$ kg rice at K480 per kg = $\frac{7}{2} \times$ K480 = K 1 580.00

Total bill = **K 5 930.00**

6. 7 loaves of bread at K80.00 each, 3kg sugar at K95, per kg, 13 packets of salt at K18.00 each, 4litres cooking oil at K186.00 per l. Prepare the bill. (**4 marks)**

Calculations

7 loaves of bread at K80	= 7 × K80	= K 560.00
3 kg sugar at K95	= 3 × K95	= K 285.00
13 packets of salt at K18 each	= 13 × 18	= K 234.00
4 litres cooking oil at K186 each	= 4 × 186	= K 764.00
Total bill		**K1,843.00**

7. Mrs Zimba had K8, 520.00 to buy the following items: 48pencils at K18.50 each, 20 knives at K100 each, 25 rulers for K1,630, 26 bottles of soft drinks at K40.00 each and 30 tablets of soap at K35.50 each. Prepare budget for these items and find her change. **(8 marks)**

Calculations

48 pencils at K18.50 = 48 × K18.50	= K 888.00
20 knives at K100 each = 20 × K100	= K 2 000.00
25 rulers for K1 630	= K 1 630.00
26 bottles of soft drinks at K40 each = 26 × K40	= K 1 040.00
30 tablets of soap at K 35.50 each = 30 × K35.50	= K 1 065.00
Total bill	= K 6 563.00

∴ The change = K8520 – K6563

= K1 957

8. **Table 2** shows Mama's budget for the month of February 2018 **(2018 Q.25b)**

Item	Quantity	Cost for one item (K)	Amount (K)
Sugar	5 packets	850.00	4250.00
Cooking oil	3 bottles	1200.00	**3600**
Soap	2 units	**800**	1600.00

(i) Complete the table

Amount for cooking oil = 3 × K1200

= K 3600.00

Cost for soap = $\frac{\text{K1600}}{2}$

= K 800

(ii) Find the total cost for Mama's budget **(4marks)**

The total cost = K (4250 + 3600 + 1600)

= K 9450.00

EXERCISE 10 A farmer bought the following items: 2 bags of maize seed at K365 per bag, 5kg of beans at K115.50 per kg, 3 bags of maize at K3450 per bag and 2 hoes at K185.80 each

a. Prepare a bill for him
b. How much change did he receive after paying K12 500.00?

1. Chifundo buys the following items; 1 heap of tomatoes at K25.00 per heap and 3 bundles of onions at K15.00 per bundle. If he gives a K500 note. Calculate the **correct** change he receives. (2003 Q.11)

2. 20 rulers at k7.71 each, 15 rubbers at K9.50 each, 3 kg beef at K210.00 per kg, 30 boxes of matches at k 4.92 each. Prepare the bill.

3. Mr phiri bought the following items for his daughter:
   2 dresses at K250 each
   4 exercise books at K 45 each
   If he paid K1 000 , how much change did he get? **(2004 Q.14)**

UNIT 11: PROFIT AND LOSS

Key words:

- Cost price
- Selling price
- Profit
- Loss
- Profit %
- Loss %

Usable formulas:

- Profit = selling price – cost price
- Selling price = cost price + profit
- Loss = cost price – selling price
- Cost price = selling price – profit

- Profit % = $\frac{\text{profit} \times 100\%}{\text{Cost price}}$

- Loss % = $\frac{\text{loss} \times 100\%}{\text{Cost price}}$

Note:

- Cost price = 100%
- Selling price with a profit = 100% + profit
- Selling price with a loss = 100% - loss

1. Find the profit made after selling 10 bales of sugar at K3,000.00 each if each bale was bought at K2,860.00 **(4 marks)**

   Cost price = 10 × K2 860
   = K28 600
   Selling price = 10 × K3 000
   = K30 000
   Profit = selling price – cost price
   = K30 000 – K28 600
   = K1 400

1. Maggie bought 15 mattresses at K9,999.00 each. She sold 12 of them at K10,500.00 each and the rest at k10,240.00 each. Calculate the total profit she made **(4 marks)**

   Cost price = 15 × K9 999.00
   = K 149 985
   Selling price = (12 × K10 500) + (3 × K10 240)
   = K 126 000 + K 30 720
   = K 156 720
   Profit = selling price – cost price
   = K 156 720 – K 149 985
   = K 6 735

2. Find the selling price of a bag of fertiliser if it was bought at K5,820.00 and made a profit of K1,400.00 after selling it. **(3 marks)**

   Cost price = K5 820.00
   Profit = K1 400
   Selling price = cost price + profit
   = K5 820 + K1 400
   = K7 220.00

3. A market vendor bought 24 units of oranges for K1,800. If 2 units were bad and the rest were sold at K78 per unit, find the loss. **(4 marks)**

   Cost price = K1 800
   Good units = (24 – 2) units
   = 22 units
   Selling price = 22 × K78
   = K1 716
   Loss = cost price – selling price
   = K1 800 – K1 716
   = K84

4. 4 units of tea packets were bought at K5,800 and sold at K195 each. Find the total profit made. **(4 marks)**

   Cost price = K5 800
   Selling price = 4 × 10 × K195
   = K7800
   Profit = Selling price – Cost price
   = K7 800 – K5 800
   = K2 000.00

5. Mr Banda bought 6 baskets of tomatoes at K780 each. He sold three of the baskets at K950 each, the other two at K1 200 each. The sixth basket was sold at K680. Find the total profit that Mr Banda made. **(6 marks) [2007 Q.32b]**

   Cost price = 6 × K780
   = K4 680
   Selling price = (3 × K950) + (2 × K1200) + K680
   = K 2 850 + K 2 400 + K680
   = K 5 930
   ∴ Profit = selling price – cost price
   = K5 930 – K 4680
   = K1 250

6. Bread is sold at K124.80 each at a profit of 4%. Calculate;
   i. The cost price per unit
   ii. Profit on each unit sold

   (i) selling price = cost price + profit
   = 100% + 4%
   = 104%
   If 104% = K124.80
   100% = less (cost price)
   ∴ $\frac{100\%}{104\%}$ × K124.80
   Cost price = K 120

   (ii) profit = Selling price – Cost price
   = K124.80 – K120.00
   = K4.80

7. A vendor bought 240 eggs for K6 000.00. Calculate the profit percent made, if 22 eggs were broken and the rest were sold at K30.00 each. **(6 marks) [2011 Q.24)**

Cost price = K 6 000.00

Good eggs = (240 – 22) eggs

= 218 eggs

Selling price = 218 × K30

= K6 540

Profit = Selling price – Cost price

= K6 540 – K6 000

= K540

∴ Profit % = $\frac{\text{profit} \times 100\%}{\text{Cost price}}$

= $\frac{\text{K 540} \times 100\%}{\text{K6000}}$

= 9%

8. A bed was sold at a loss K1650. If the cost price of the bed was K3510. What was the selling price **(3 marks) [2010Q.4)**

Loss = K1650

Cost price = K3510

Selling price = cost price – loss

= K3510 – K1650

= K1 860

9. A grocer bought 100 packets of yeast at K126.50 per 10 packets. If the yeast was sold at a profit of K2.50 per packet, calculate the total selling price.

Cost price = $\frac{100}{10} \times$ K 126.50

= K1265.00

Profit = 100 × K2.50

= K250

Total selling price = cost price + profit

= K 1265 + K250

= K1 515

10. A boy sold 150 oranges. Find the amount he paid as a market fee if he was charged 20t on each orange sold. **(3 marks) [2006 Q.19]**

1 orange = 20t

150 oranges = more

∴ 150 × 20t

= 3000t

$= \frac{3000t \times K1}{100t}$

= K30.00

11. A girl bought 2 units of apples at K300 and sold each apple at a profit of K5. Find the selling price of the 2 units of apples (4 marks) **[2004 Q.8]**

Cost price = K300

Profit = 20 × K5

= K100

Selling price = cost price + profit

= K300 + K100

= K400

12. By selling a radio at K4 200, trader makes a loss of 30%. Calculate the cost price of the radio. **(5 marks) [2005 Q.23)**

Selling price = (100% - 30%)

= 70%

If 70% = K4 200

Cost price = more (100%)

$\therefore \frac{100\%}{70\%} \times$ K4 200

Cost price = K (100 × 60)

= K6 000

13. Chippo bought a box of pencils at K 6,400. She sold them at K7,040. What was her profit percent? **(5 marks)**

Cost price = K6 400

Selling price = K 7 040

Profit = selling price – cost price

= K7 000 – K6 400

= K640

∴ Profit % = $\frac{\text{profit} \times 100\%}{\text{cost price}}$

= $\frac{\text{K640} \times 100\%}{\text{K6 400}}$

= 10%

14. A fridge was bought at K62,500 and sold at K61, 250. Find the loss percent **(5 marks)**

Cost price = K62 500

Selling price =K61 250

Loss = cost price – selling price

= K62 500 – K61 250

= K1 250

∴ Loss % = $\frac{\text{Loss} \times 100\%}{\text{Cost price}}$

= $\frac{\text{K1 250} \times 100\%}{\text{K62 500}}$

= 2%

15. Dalitso lost 3% after selling a radio for K46 560.00. Find the amount she lost. **(5 marks)**

Selling price = (100% - 3%)

= 97%

If 97% = K46 560

100% = more (Cost Price)

∴ $\frac{100\% \times \text{K46 560}}{97\%}$

Cost price = K48 000

Loss = Cost price – Selling price

= K48 000 – K 46 560

= K1 440

16. Tawina made a loss by selling 8 baskets of tomatoes for K1820. If the cost price of each basket was K 250.00, calculate the loss percent **(5 marks) [2009 Q.33b]**

Selling price = K1 820

Cost price = 8 × K250

= K2 000

Loss = cost price – selling price

= K2 000 – K1 820

= K180

Loss% = $\frac{\text{Loss} \times 100\%}{\text{Cost price}}$

= $\frac{\text{K180} \times 100\%}{\text{K2 000}}$

= 9%

17 A trader lost 10% by selling a motorbike for K125,000, at what price should it be sold to make a profit of 5%?

Selling price = (100% - 10%)

= 90%

If 90% = K125 000

100% = more (CP)

∴ $\frac{100\%}{90\%} \times$ K125 000

Cost price **= K138 888.89** (2 d.p)

To gain 5% = (100 + 5) %

= 105%

If 100% = K138 888.89

105% = more

∴ $\frac{105\%}{100\%} \times$ K138 888.89

= K145 833.45

10. After selling a bicycle at K10,800, a person made a loss of 10%. At what price must the person sold it to gain 5%? **(5 marks) [2014 Q.25]**

Selling price = (100% - 10%)

= 90%

If 90% = K10 800

100% = more (CP)

$\therefore \frac{100\%}{90\%} \times$ K10 800

= K12 000 (CP)

To gain 5% = (100 + 5) %

= 105%

If 100% = K 12 000

105% = more

$\therefore \frac{105\%}{100\%} \times$ K12 000

= K12 60

11. A shopkeeper bought a tin of paint at K2 500.00 and sold at K2 900.00. Calculate the profit percent. **(4 marks) [2014 Q.10]**

Cost price = K 2 500

Selling price = K 2 900

Profit = Selling price – Cost price

= K2 9000 – K2 500

= K400

Profit % = $\frac{\text{Profit} \times 100\%}{\text{Cost price}}$

= $\frac{\text{K400} \times 100\%}{\text{K2 500}}$

= 16%

12. By selling a car for K500 000, a loss was made at the rate of 6t per kwacha. Find the amount lost. **(3 marks) [2013 Q.18]**

Amount lost = $\frac{6t}{100t} \times$ K500 000

= K (6 × 5000)

= K30 000

13. A shirt was sold for K2 000.00. If it was sold at a profit of 25%, calculate the cost price. **(4 marks) [2012 Q.24]**

Selling price = (100% + 25%)

= 125%

If 125% = K2 000

100% = less (CP)

$\therefore \frac{100\%}{125\%} \times$ K 2 000

= K1 600

14. Tayamika bought 20 mangoes at 4 for 40t and she sold them at 5 for 60t. What was her profit? **(3 marks) [2011 Q.12]**

Cost price = $\frac{20}{4} \times$ 40t

= K200t

Selling price = $\frac{20}{5} \times$ 60t

= 240t

Profit = (240 – 200) t

= 40t

15. By selling 4 tins of rice at K9,000.00 per tin, a trader made a loss of 10%. Calculate the cost price of rice per tin. **(5 marks)**

Selling price = (100% - 10%)

= 90%

If 90% = K9000

100% = more (cost price)

$\therefore \frac{100}{90} \times$ K9000

= K10,000.00

16. A person bought 20 units of fruits for K2000 and sold them at a profit of K50 each. Calculate the selling price of each fruit. **(3 marks)**
[2018 Q.25a]

Cost price = K2000
Profit = 20 units × K 50
= K1000
Selling price = profit + cost price
= K1000 + K2000
= K3000 (20 units)
Each fruit = $\frac{\text{K 3000}}{200}$
= K15

EXEERCISE 11

1. Mable bought 16 crate of soft drinks at K700 per crate and sold them at K800 per crate. Find the total profit made.
2. Bertha bought cooking oil at K 42,300. He sold it at a profit of 15%. What was his selling price
3. By selling a plot for k149 408, a loss is made at the rate of 8t in the kwacha. Find :
   i. The amount lost
   ii. The cost price of the plot
4. Miss Banda sold a drum at K 1 996.50. she made a profit of K 289.50. Find the cost price of the drum.
5. Linda bought 250 bags of ground nuts at K5 500.00 each. If 120 bags were sold at a loss of 150.00 each. Find the selling price.
6. A school shop buys 100 units of pens for k15 350.40 and sells them at K164 per unit. Find the profit percent.
7. Esther bought two 10 litres of cooking oil at K22 500 and sold them at K18 000. Find her loss percent.
8. Patricia lost 10% by selling clothes for K150 000. At what price must sold to gain a profit of 5%.

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Mr Phiri is renowned Primary School teacher with vast experience in science subjects and these notes have been formulated in a way so as to make Mathematics no longer a burden.

Other notes for all the subjects for senior section are also available written by the same Writer.

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MANEB KEY

CORE- ELEMENTS AND THEIR RESPECTIVE MARKS

(HOW MARKS ARE ALLOCATED DURING EXAMINATIONS)

1. **NUMBERS, OPERATIONS AND RELATIONSHIP (25 Marks)**

TOPICS FROM STANDARD 5

- Counting
- Addition
- Subtraction
- Multiplication
- Division
- Factors and multiples
- Common fractions
- decimal numbers

TOPICS FROM STANDARD 6

- Counting
- Addition and Subtraction
- Multiplication and Division
- Basic operations
- HCF
- LCM
- Fractions
- Rate
- Ratio
- Decimals
- Approximation and Estimation

TOPICS FROM STANDARD 7

- Numbers
- Roman numerals
- Basic operations on whole numbers
- Additions and Subtractions
- Multiplications and Divisions
- Averages
- HCF and LCM
- Basic operation of fractions
- Basic operation on decimals
- Approximation and Estimation
- Rate, Ratio and proportion
- Percentages

TOPICS FROM STANDARD 8

- Roman numerals
- HCF and LCM
- Averages
- fractions
- Decimals
- Approximation and Estimation
- Rate ,Ratio and Proportion
- Percentages

2. ACCOUNTING AND BUSINESS STUDIES (25 Marks)

TOPICS FROM STANDARD 5

- Addition of money
- Subtraction of money
- Multiplication of money
- Division of money

TOPICS FROM STANDARD 6

- Money
- Addition of money
- Subtraction of money
- Multiplication of money
- Division of money

TOPICS FROM STANDARD 7

- Bills and Budget
- profit and Loss
- Commission and Discount
- Postal services
- Bank services
- Cash account
- Bank account

TOPICS FROM STANDARD 8

- Money
- Bills and budget
- Profit and Loss
- Discount and Commission
- Taxes
- Premium
- Postal services
- Bank services
- Simple account

3. SPACE AND SHAPE (10 Marks)

STANDARD 5

- Geometrical shapes in the environment
- space

TOPICS FROM STANDARD 6

- angles

TOPICS FROM STANDARD 7

- Geometrical shapes

TOPICS FROM STANDARD 8

- constructions
- Scale drawing

4. MEASUEMENTS (20 Marks)

TOPICS FROM STANDARD 5

- Length
- Capacity
- Mass
- Area
- Volume

TOPICS FROM STANDARD 6

- Length
- Capacity
- Mass
- Time
- Area
- Volume
- Temperature

TOPICS FROM STANDARD 7

- Length, Capacity and Mass
- Time
- Area

- Volume
- Temperature

TOPICS FROM STANDARD 8

- Perimetre
- Mass
- Area
- Capacity and Volume
- Temperature
- Graphs
- Additions of like terms
- Subtractions of like terms
- Number sentences
- Inequalities

5. PATTERNS,FUNCTIONS AND ALGEBRA (10 Marks)

TOPICS FROM STANDARD 5

- Patterns
- algebraic expressions

TOPICS FROM STANDARD 6

- Patterns
- number sentences
- Inequalities

TOPICS FROM STANDARD 7

- Patters

TOPICS FROM STANDARD 8

- Patterns
- Like and Unlike terms
- linear equations
- Inqualities
-

6. DATA HANDLING (10 Marks)

TOPICS FROM STANDARD 5

- Picture and bar graph

TOPICS FROM STANDARD 6

- Graphs

TOPICS FROM STANDARD 7

- Graphs

TOPICS FROM STANDARD 8

- Graphs
- Mean , Mode and Median

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