

MATHEMATICS

QUESTIONS

AND MODEL ANSWERS

FOR STANDARD 8

UNIT 1: ROMAN NUMERALS

Each question from this topic is 2 Marks.

1. Convert 110 to Roman numerals.
= CX
2. Convert 175 to Roman numerals.
= CLXXV
3. Convert 99 to Roman numerals.
= XCIX
4. Change 217 to Roman numerals.
= CCXVII
5. Change XCIX into Hindu Arabic numerals.
 $XCIX = 90 + 9$
=99
6. Change XVIII into Roman Arabic numerals.
 $XVIII = 10 + 5 + 1 + 1 + 1$
=18
7. Write XCVI to Hindu Arabic numerals.
 $XCVI = 90 + 5 + 1$
= 96
8. Express XXXVIII to Hindu Arabic numerals.
 $XXXVIII = 10 + 10 + 10 + 5 + 1 + 1 + 1$
= 38
 - Ascending order means from the smallest to the largest
 - Descending order means from the largest to the smallest
9. Arrange XVIII , IV, XIX, XI, XX in descending order.
= XX, XIX, XVII, XI, IV
10. Arrange III, XII, XV, XIX in descending order.
=XIX, XV, XII, III
11. Arrange CXXX, CL, DCX, DCCL, DL in descending order.
=DCCL, DCX, DL, CXXX, CL
12. Arrange L, XL, XXX, XVII, XV in ascending order.
= XV, XVI, XXX, XL, L
13. Arrange V, XVIII, VI, XI, XX, VII in ascending order.
= V, VI, VII, XI, XVIII, XX
14. Arrange VI, XIX, XIV, III, V in ascending order.
= III, V, VI, XIV, XIX
15. Fill the missing numerals V, VI, VII, __, IX, __, __, XII.
= V, VI, VII, VIII, IX, X, XI, XII
16. Fill the missing numerals X, __, VIII, __, __, V, IV.
= X, IX, VIII, VII, VI, V, IV
17. Fill the missing numerals C, XC, __, LXX, __, __, XL
= C, XC, LXXX, LXX, LX, L, XL



UNIT 2: HIGHEST COMMON FACTOR AND LOWEST COMMON MULTIPLE

A. HIGHEST COMMON FACTOR (HCF)

- 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, Biggest Number, Highest Number.

- 18.** 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)

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

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

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

$$\text{HCF} = 2 \times 2 \times 2 \times 2 \times 5 = 80$$

- 20.** Find the HCF of 80, 320 and 720 using factor method (5marks)

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

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

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

$$\text{HCF} = 2 \times 2 \times 2 \times 2 \times 5 = 80$$

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

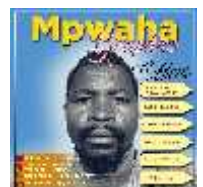
2	18	24	36
2	9	12	18
2	9	6	9
3	9	3	9
3	3	1	3
	1	1	1

$$\text{HCF} = 2 \times 3 = 6$$

- 22.** 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	1

$$\text{HCF} = 3 \times 5 = 15$$



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

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

HCF = 3

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

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

HCF = 80

OR

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

HCF = 80

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

4	360 → 504	1
	-288 -360	
	72 → 144	2
	0	
	72 → 864	12
	-864	
	0	

HCF = 72

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

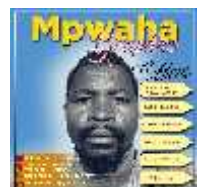
4	289 → 357	1
	-272 -289	
	17 → 68	4
	-68	
	0	

HCF = 17

27. 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



EXERCISE1

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]

B. 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

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

$$70 = 2 \times 5 \times 7$$

$$84 = 2 \times 2 \times 3 \times 7$$

$$105 = 3 \times 5 \times 7$$

$$\text{LCM} = 2 \times 2 \times 3 \times 5 \times 7 \\ = 420$$

29. Find the smallest number which is a multiple of 15, 18, 24 and 27

$$15 = 3 \times 5 \quad (5\text{marks})$$

$$18 = 2 \times 3 \times 3$$

$$24 = 2 \times 2 \times 2 \times 3$$

$$27 = 3 \times 3 \times 3$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ = 216$$

30. 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?

$$12 = 2 \times 2 \times 3 \quad (5\text{marks})$$

$$10 = 2 \times 5$$

$$2 = 2$$

$$6 = 2 \times 3$$

$$\text{LCM} = 2 \times 2 \times 3 \times 5 \\ = 60$$

31. 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

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7 \times 13 \\ = 16\,380$$

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

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

$$105 = 3 \times 5 \times 7$$

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

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7 \times 13 \\ = 16,380$$



33. Find the LCM of 10,14,50and40 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

$$\text{LCM} = 2 \times 2 \times 2 \times 5 \times 5 \times 7 \\ = 1400$$

34. A shop keeper bought cartons of soap in multiples of 20,30and60ata wholesale price. Find the least number of cartons the whole sale bought. (5marks)

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

$$\text{LCM} = 2 \times 2 \times 3 \times 5 \\ = 60$$

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

2	27	96	105
2	27	48	105
2	27	24	105
2	27	12	105
2	27	6	105
3	27	3	35
3	9	1	35
3	3	1	35
5	1	1	35
7	1	1	7
	1	1	1

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 \\ = 30240$$

$$\text{HCF} = 3$$

$$\therefore \frac{\text{LCM}}{\text{HCF}} = \frac{30240}{3} \\ = 10080$$

36. Find the difference between the HCF and LCM of 24, 18 , 20 and 36

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

(7marks)

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 \\ = 360$$

$$\text{HCF} = 2$$

$$\therefore \text{LCM} - \text{HCF} = 360 - 2 \\ = 258$$



EXERCICE2

1. Calculate the HCF of 473, 559 and 645 using continued division method (5marks) [43]

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

37. Simplify $16\frac{1}{8} + 8\frac{1}{4} \div 3\frac{2}{3}$ (5 Marks)

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

UNIT 4: DECIMALS

Decimal's place value guide:

T T H T H T O . t h t h

Examples

- i. Write 185.02 in their place values =
T T H T H T O . t h t h
1 8 5 . 0 2

- ii. Find the sum of 127.45 and 1.580 =

$$\begin{array}{r} \text{T T H T H T O . t h t h} \\ 127.45 \\ + 1.580 \\ \hline \end{array}$$

38. Add together 500.06, 76.7, 9.048 and 567.6 (3marks)

$$\begin{array}{r} 129.030 \\ 500.06 \\ 76.7 \\ 9.048 \\ + 567.6 \\ \hline 1153.408 \end{array}$$

39. Subtract 832.6547 from 2563.13 (2marks)

$$\begin{array}{r} 2563.13 \\ - 832.6547 \\ \hline \end{array}$$



1730.4753

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

$$\begin{array}{r} 114.0\text{l} \\ +72.5\text{l} \\ \hline 186.5\text{l} \\ -91.8\text{l} \\ \hline 94.7\text{l} \end{array}$$

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

$$\begin{array}{r} 25.04 \\ +96.75 \\ \hline 121.79 \\ -72.5 \\ \hline 49.29 \end{array}$$

42. 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) (5 marks)

If 4.4408 l = 1 min
92.952 l = more

$$\begin{aligned} \therefore &= \frac{92.952 \times 1 \text{ min}}{4.4408\text{l}} \\ &= \frac{92.952}{4.4408} \times \text{min} \\ &= 20.93 \text{ min} \end{aligned}$$

If 1 l/tank = 20.93 min

3.5 l/tank = more

$$\begin{aligned} \therefore & \frac{3.5 \times 20.93 \text{ min}}{1\text{l}} \\ &= 73.255 \text{ min} \\ &= 73.26 \text{ min (2dp)} \end{aligned}$$

43. Simplify $(0.112 \div 5.6) \times 4.2$
 $= (0.112 \div 5.6) \times 4.2$
 $= 0.02 \times 4.2$
 $= 0.084$

44. 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 (4 marks)

$$\begin{array}{r} 260.9\text{l} \\ -87.8\text{l} \\ \hline 173.1\text{l} \end{array}$$

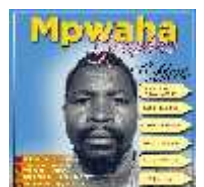
If 1 l = K520.80

173.1 l = more

$$\begin{aligned} &= \frac{173.1 \times \text{K}520.80}{1\text{l}} \\ &= \text{K}90150.48 \end{aligned}$$

45. Simplify $0.12 - 0.02 \times 0.65$ (4 marks) [2012 Q.21]

$$\begin{array}{r} 0.65 \\ \times 0.02 \\ \hline 130 \\ 000 \\ +000 \\ \hline 0.0130 \\ 0.12 \\ -0.1030 \\ \hline \end{array}$$



0.1070

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

$$\begin{array}{r} 84.04 \\ 22.00 \\ 0.55 \\ + 8.00 \\ \hline 114.59 \end{array}$$

47. Simplify $3.2 + 4.65 \div 1.5$
(3marks) [2014 Q.1]
 $= (4.65 \div 1.5) + 3.2$
 $= 3.1 + 3.2$
 $= 6.3$

48. Simplify $\frac{0.6}{1.12} \times 0.8$ (4marks)
[2013 Q.9]
 $= 0.6 \times 0.8$
 $= \frac{0.48}{0.012}$
 $= \frac{480}{12}$
 $= 40$

49. Write 17.025 as a mixed number in its lowest term (3marks)
(2009 Q.1)
 $= \frac{0.025}{0.010}$
 $= \frac{25}{100}$
 $= \frac{1}{4}$
 $= 17\frac{1}{4}$

50. Simplify $(0.112 \div 5.6) \times 4.2$
(3marks) [2007Q.4]
 $= (0.112 \div 5.6) \times 4.2$
 $= 0.02 \times 4.2$

=0.084

51. Change 7.35km to m. (3marks)

If 1km = 1000m
7.35km = more

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

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

$$= 7350 \text{ m}$$

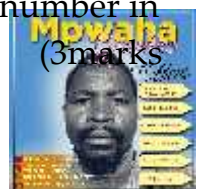
52. Change 12749t to decimal notation
(2marks)

$$\begin{aligned} &= 12749 \text{ t} \\ &= \frac{12749}{100} \end{aligned}$$

$$= \text{K}127.49$$

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 Marks)
4. By what must 0.006 be multiplied to give 0.048144 (4marks)
5. The area of a rectangle is 71.043 m^2 and the length is 32.06m. Find its width. (4marks)
6. A hotel buys 87.045kg 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

53. Correct 69.999 to 1 decimal places.
 $= 69.9/99$
 $= 70$

54. Correct 0562.09021 to 1 decimal places.
 $= 0562.0/9021$
 $= 562.1$

55. Express 0.0615 to 2 decimal places.
 $= 0.06/15$
 $= 0.06$

56. Express 145.52456 to 3 decimal places.
 $= 145.524/56$
 $= 145.525$

57. Express 0.003810 to 3 decimal places.
 $= 0.003/810$
 $= 0.004$

58. Express 80.045 as a mixed number.
 $= 80.045$
 $= 80\frac{45}{1000}$
 $= 80\frac{9}{200}$

59. Write 30.002 as a mixed number
 $= 30.002$
 $= 30\frac{2}{1000}$
 $= 30\frac{1}{500}$

60. Write 44.7 to the nearest 10.
 $= 44.7$
 $= 45$

61. Express 59 to the nearest 10.
 $= 59$
 $= 60$

62. Write 911 to the nearest 100.
 $= 911$
 $= 900$

63. Write 46,412 to the nearest 1000.
 $= 46,412$
 $= 46,000$

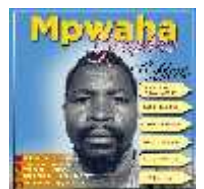
64. Express 1549 to the nearest 100.
(2014 Q8)
 $= 1549$
 $= 1500$

65. Divide 784 by 10 giving your answer correct to the nearest whole number.
 $= 784 \div 10$
 $= 78.4$
 $= 78$

66. Express 198059 to the nearest hundred.
 $= 198059$
 $= 198100$

67. Express 12.86403 to nearest whole number.
 $= 12.86403$
 $= 13$

68. Correct 86943.5452 to the nearest tenth.
 $= 86943.5/452$
 $= 86943.5$



69. Correct 22.2333 to the nearest hundredth.
 $= 22.23/33$
 $= \mathbf{22.23}$
70. Find the area of a square whose side is 34.06, giving your answer correct to the nearest cm (square centimeter).
Area of a square = S \times S
 $= (34.06 \times 34.06) \text{ cm}^2$
 $= 1160.0836 \text{ cm}^2$
 $= \mathbf{1160 \text{ cm}^2}$
71. Express 0.1451 to 2 significant figures. (2004 Q.2)
 $= 0.1451$
 $= \mathbf{0.15}$
72. Express 3.0552 to 2 significant figures. (2010 Q.2)
 $= 3.0552$
 $= \mathbf{3.1}$
73. Write 0.0798 to 2 significant figures. (2011 Q.10)
 $= 0.0798$
 $= \mathbf{0.08}$
74. Write 0.120532 to 3 significant figures.
 $= 0.120532$
 $= \mathbf{0.121}$
75. Express $\frac{5}{7}$ as decimals and correct to 4 places
 $7 \div 5 = 0.71428$
 $= 0.7142/8$
 $= \mathbf{0.7143}$

EXERCISE 5

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

UNIT 6: RATE

76. 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. (4 marks)

Distance = 300 km

Cost = K4, 800

If 300Km = K4, 800

1km = less

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

300km

$= \mathbf{K16}$

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

If 3 hrs = K10, 000

1hr = less

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

3 hrs



=K3 333.33

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

Distance = 217km

Time = 7 hrs

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

$$\frac{217\text{km}}{7\text{hrs}} \\ = 31 \text{ km/hr}$$

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

- a. The Speed of the lorry and the car

Speed for a lorry = $\frac{\text{Distance}}{\text{Time}}$
 $= \frac{600 \text{ km}}{8 \text{ hrs}}$

= 75 km / hr

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. (3 marks)

Time the lorry arrived = 6:00am + 8hrs
2:00pm (14:00)

Time a car arrived = 6:00 +5hrs
= 11:00 am

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

Distance = 21km

Speed = 5km/hr

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

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

= 4 hrs 2 min (4 .2hrs)

81. A minibus takes 2 ½ hours to travel from a town to a village at the speed of 50 km/hr. how far is the village from the town?(4 marks)

Time = 2 ½ hrs

Speed = 50km/hr

Distance = Speed X Time

$$\frac{50\text{Km}}{\text{Hr}} \times \frac{5\text{Hrs}}{2} \\ =125\text{km}$$

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



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

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

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

Speed = 82 km /hr

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

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

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

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

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

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

84. A min bus 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. (5 marks)[2017 Q.25 repeated 2006 Q.33]

Speed = 60 km /hr

Time = From 11:30 am to 3:00pm
 (3hrs 30min)
 =3 $\frac{1}{2}$ hrs

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

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

=210km

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

Starting time = 7:30am

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

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

Time = From 7:30am to 10:30am
 = 3hrs

Speed=90km/hr

Distance = Speed X Time

90km/hr X 3hrs

=270km

87. A min bus 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 30 min
 =3 $\frac{1}{2}$ hrs



Distance = Speed X Time

$$\frac{60 \text{ km}}{\text{Hr}} \times \frac{7 \text{ hrs}}{2}$$

$$\text{Hr} \quad 2$$

$$= 210 \text{ km}$$

88. .

- a. Two cars leave Blantyre for Lilongwe at the same time , one via Zalewa a distance of 360 km and the other via Zomba a distance of 420km. If both cars are travelling to 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 = $\frac{\text{Distance}}{\text{Speed}}$

$$= \frac{360 \text{ km}}{120 \text{ km/hr}}$$

$$= 3 \text{ hrs}$$

II. A Car via Zomba

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

$$= 3 \text{ hrs } 5 \text{ min}$$

$$= 3 \text{ hrs } 5 \text{ min}$$

Time difference

$$= (3 \text{ hrs } 5 \text{ min} - 3 \text{ hrs})$$

$$= 5 \text{ min}$$

- b. A cyclist left his home at 9:00 am for the market travelling at a speed of 24km/hr. He rested 1 ½ hours and continued with the journey at the same speed. If he 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
= $(6 - 1 \frac{1}{2}) \text{ hrs}$

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

Distance = Speed × Time

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

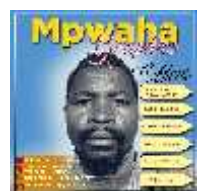
$$= 108 \text{ km}$$

EXERCISE 6

1. A bus travel from 8:00pm a distance of 520km. How long does it take if it stopped for 30 minutes, find his rate of walking in km/hr. (3 marks)
2. If a car travels 30km in 15 minutes, and bus travels 35km in 20 minutes. Find their difference in km per minutes. [4 marks]

UNIT 7: RATIO AND PROPORTION

89. Express 861 to 2581 to its lowest form {2 marks}
- Ration = 86:258
- $$= 1:3$$



90. 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

- 91.** Increase K 780.72 in the ratio 7:4 (**3 marks**)

$$= \frac{7}{4} \times \text{K}780.72$$

$$= 7 \times \text{K}195.18$$

$$= 1366.26$$

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

$$= \frac{2}{5} \times \text{K}45,500$$

$$= 2 \times \text{K}9100$$

= K18, 200

- 93.** 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

$$9/2 \times 12.00$$

$$= 9 \times 6$$

=K54 {total amount}

94. A certain amount of money was shared among three children in ratio 2:3:5. If the least got K3, 000.

Calculate the total amount. (5

marks) {2012 Q.27}

Ratio = 2:3:5

Total ratio = 2+3+5

$$=10$$

If 2 =K3, 000(least)

10 = more

$^{10}/_2 \times \text{K}3,000$

$$= 10 \times \text{K}1,500$$

=K15, 000

- 95.** 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)

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

$$= 2 \times 28$$

= 56 mangoes

OR

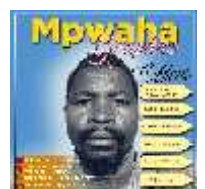
Total ratio = 5+2

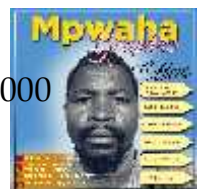
$$= 7$$

If $\frac{S}{s} = 140$

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

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





$$=K (2 \times 1,000)$$

$$=K2, 000$$

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

$$=K1, 000$$

- 102.** 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)

$$\text{Ratio} = 2:3:5$$

$$\text{Total ratio} = 2+3+5$$

$$\text{If } 2 = K 4,500 \text{ (least)}$$

$$10 = \text{more}$$

$$\frac{10}{2} \times K4, 500$$

$$5 \times K4, 500$$

$$K22, 500$$

- 103.** Three farmers put together money in the ratio 2:3:5 to buy fertilizer. Calculate the bags of fertilizers each farmer received, if they bought 486 bags. (7 marks)

$$\text{Total ratio} = 2+3+4$$

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

$$= (2 \times 54) \text{ bags}$$

$$= 108 \text{ bags}$$

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

$$= (3 \times 54) \text{ bags}$$

$$= 162 \text{ bags}$$

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

$$= (4 \times 54) \text{ bags}$$

$$= 216 \text{ bags}$$

- 104.** 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}

$$\text{Total ratio} = 5 + 7$$

$$= 12$$

$$\text{If } 7 = 42 \text{ sweets (chikondi)}$$

$$12 = \text{more}$$

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

$$7$$

$$= (12 \times 6) \text{ sweets}$$

$$= 72 \text{ sweets}$$

- 105.** 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?(3 marks)

$$\text{Total ratio} = 4 + 7 + 9$$

$$= 20$$

$$\text{Mwali}$$

$$= \frac{7}{20} \times 3, 960$$

$$= K \{7 \times 198\}$$

$$= K1, 386$$



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

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

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

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

$$= 9 : 18$$

$$= 1 : 2$$

- 107.** 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]

$$\begin{aligned} \text{Ratio} &= 24 \times \frac{1}{2} : 24 \times \frac{3}{8} \times 24 \\ &\text{(multiply both sides by the LCM 24)} \\ &= 12 : 9 : 16 \end{aligned}$$

$$\begin{aligned} \text{Total ratio} &= 12+9+16 \\ &= 37 \end{aligned}$$

$$\begin{aligned} 1^{\text{st}} \text{ person} &= \frac{12}{37} \times 370 \\ &= 12 \times 10 \\ &= 120 \end{aligned}$$

$$\begin{aligned} 2^{\text{nd}} \text{ person} &= \frac{9}{37} \times 370 \\ &= 9 \times 10 \\ &= 90 \end{aligned}$$

$$\begin{aligned} 3^{\text{rd}} \text{ person} &= \frac{16}{37} \times 370 \\ &= 16 \times 10 \\ &= 160 \end{aligned}$$

- 108.** If 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)

$$\begin{aligned} \text{Ratio} &= \text{Pit latrines} : \text{people} \\ &= 1:2 \end{aligned}$$

$$\begin{aligned} \text{If 1 pit} &= 2 \text{ people} \\ 11 \text{ pits} &= \text{more} \end{aligned}$$

$$\begin{aligned} &\frac{11}{1} \times 2 \text{ people} \\ &= (11 \times 2) \text{ people} \\ &= 22 \text{ people} \end{aligned}$$

- 109.** 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)

$$\text{The youngest} = \frac{45}{100} \times \text{K5, 400}$$

$$\begin{aligned} &= \text{K} (45 \times 54) \\ &= \text{K2, 430} \end{aligned}$$

$$\begin{aligned} \text{The remainder} &= \text{K5, 400} - \text{K2, 430} \\ &= 2, 970 \end{aligned}$$

$$\frac{45}{100} \times \text{K2,970}$$

$$\begin{aligned} &= \text{K} (6 \times 297) \\ &= \text{K1, 782} \end{aligned}$$

- 110.** 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

20 days X 540 pupils

15 days

= $[20 \times 36]$ pupils

=720 pupils

- 111.** 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 = 10 days

10 people = more

$\frac{24}{10} \times 20$ days [remaining days]

= $[24 \times 2]$ days

= 48 days

- 112.** 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

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

= $[2 \times 12]$ ages

=24 ages

- 113.** 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. (5 marks) [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

30

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

$\frac{30}{30} \div \frac{13}{30} \times \text{K}26,000$

= $\frac{30}{30} \times \frac{30}{13} \times \text{K}26,000$

=K60, 000

EXERCISE 7

1. Wongani and Thoko shared oranges in the ratio $2\frac{1}{2} : 4\frac{1}{2}$. 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 cost.
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 hours 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)

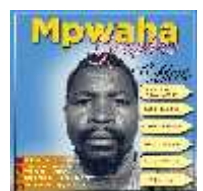
UNIT 8 : PERCENTAGES

1. Express $8\frac{2}{3}$ as percentage (4 marks)
 $8\frac{2}{3} = \frac{26}{3}$

 $\frac{26}{3} \times 100\%$
 $\frac{2600}{3} \%$
 $= 866\frac{2}{3}\% \text{ or } 866.675 \text{ (2 dp)}$
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)
 $90\% = \frac{90}{100}$
 $\text{Marks} = \frac{90}{100} \times 20$
 $= (2 \times 9) \text{ marks}$
 $= 18 \text{ out of } 20$
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)
 $\text{Depth of well holds water} = 1.75\text{m}$
 $= 1\frac{75}{100} \times 100\%$
 $= (1 + 75)\%$
 $= 76\%$



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

$$\begin{aligned}3:40 &= \frac{3}{40} \\&= \frac{3}{40} \times 100\% \\&= (3 \times 2.5) \% \\&= 7.5\%\end{aligned}$$

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

$$=700 + (11\% \text{ of } 700)$$

$$\begin{aligned}&700 \times (11\% + 100\%) \\&=700 + \frac{11}{100} \times 700 \\&=700 + 77 \\&=777\end{aligned}$$

or

$$\begin{aligned}&=700 \times \frac{111}{100} \\&=7 \times 111 \\&=777\end{aligned}$$

9. Increase 88 by 200% (3 marks)

$$\begin{aligned}&=88 + (200\% \text{ of } 88) \\&=88 + \frac{200}{100} \times 88 \\&=88 + 176 \\&=264\end{aligned}$$

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

$$\begin{aligned}&=120 - (5\% \text{ of } 120) \\&=120 - \frac{5}{100} \times 120 \\&=120 - 6 \\&=114\end{aligned}$$

OR

$$\begin{aligned}&=120 \times (100\% - 5\%) \\&=120 \times \frac{95}{100} \\&=6 \times 19 \\&=114\end{aligned}$$

11. Decrease 30 by 10% (3 marks)

$$\begin{aligned}&=30 \times (100\% - 10\%) \\&=30 \times \frac{90}{100} \\&=3 \times 9 \\&=27\end{aligned}$$

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

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

$$\begin{aligned}\text{Ratio} &= \text{girls} : \text{boys} \\&=300:200 \\&=3:2\end{aligned}$$

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

$$\begin{aligned}\text{Total ratio} &= 3 + 2 \\&= 5\end{aligned}$$

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

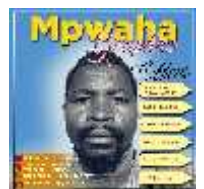
$$\begin{aligned}&= (3 \times 20) \% \\&= 60\%\end{aligned}$$

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)

$$\begin{aligned}\text{Discount} &= (100 - 12)\% \\&= 88\%\end{aligned}$$

$$\text{If } 88\% = \text{K}132\,000$$



100%=more (original price)

$$\frac{100}{88} \times K132\,000$$

88

$$=K(100 \times 1500)$$

$$=K150\,000$$

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

$$\frac{1}{3} = 0.3333$$

$$0.3333(3 \text{ decimal places})$$

$$=0.333$$

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]

$$\text{Total marks} = 20$$

$$\text{Chifundo} = \frac{80}{100} \times 20$$

$$=8 \times 2$$

$$=16$$

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]

$$\text{Number of girls at school} = \frac{25}{100} \times 800$$

$$=(\frac{25}{100} \times 800) \text{ girls}$$

$$=200 \text{ girls}$$

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

$$=150 \text{ girls}$$

Girls do not stay at boarding

$$= 200 - 150$$

$$= 50 \text{ girls}$$

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 Q11]

$$\text{Books not burnt} = [100-96]\%$$

$$=4\%$$

$$\text{If } 4\% = 200 \text{ books}$$

$$100\% = \text{more (original number of books)}$$

$$100 \times 200 \text{ books}$$

$$4$$

$$= (100 \times 50) \text{ books}$$

$$= 5,000 \text{ (books in the library)}$$

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

$$\text{If the original price was K150.00 per litres, calculate the new price for 2 litres.}$$

$$\text{litres. (5 marks) [2009 Q.2]}$$

$$\text{litres. (5 marks) [2009 Q.2]}$$

$$=K150 \times (100\% + 15\%)$$

$$=K150 \times 115\%$$

$$=K150 \times \frac{115}{100}$$

$$100$$

$$=345/2$$

$$=K172.50 \text{ (For 1 litre)}$$

$$2 \text{ litres} = K172.50 \times 2$$

$$=345.00$$

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

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

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

$$= 76\%$$



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

25

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

$$= 56\%$$

$$\text{Different in percentages} = 76\% - 56\%$$

$$= 20\%$$

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]

$$\text{Talking} = 18 \text{ min}$$

$$\text{Music} = (60 - 18) \text{ min}$$

$$= 42 \text{ min}$$

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

$$= 70\%$$

$$= 70\%$$

$$= 70\%$$

EXERCISE 8

1. Change $4 \frac{5}{7}$ to an improper fraction
[2017 Q.5]
2. A district has 94 000 people. If the population increased at the rate of $4\frac{1}{2}\%$
3. In 1999, a farmer sold his crops amounting to K36, 000. In the following year, the sales increases by 10 % . How much did the farmer get in 2000? (2006 Q.11)
4. By what percentages 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 k 10000.00. how much did the customer pay?

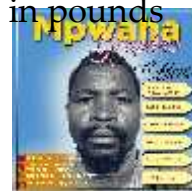
UNIT 9 : MONEY

The 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 utilized on the table where as 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	K21.74	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? 93 marks)

Rate = K294.27

If K294.27=£1

K385, 493.70=more

K385, 393.70 X £1
K294.27

=£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
 $\frac{K439,859}{K141.89} \times 1\$$

=**\$3100**

3. Chance sent K382, 551 to his mother who is in Britain, 1/3 of the amount was used as a processing fee for sending the money. How many pounds (£) did she receive? 9 correct to the nearest whole number)

Amount converted
= $\frac{1}{3} \times K 382, 551$

=K127, 517

If K294. 27 = 1£

K127, 517 = more

$\frac{K127,517}{K294.27} \times 1£$

= **£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

\$170=more

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

=170 X K 139.10
K23, 647

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

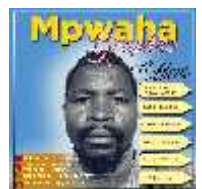
Rate = K282.95

If £1=K282.95

£220= more

$\frac{£220}{£1} \times K282.95$

=K62, 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

= 2040 pula

Rate = K21.74

2040 pula X K21.74

1 Pula

=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? (6 marks) [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

\$40 x K139.10

\$1

=K(5,564.00 + 940.00)

=K6, 504

From Daughter = R 50

Rate = K 18.80

If R1 = 18.80

R50 = more

R50 X K18.80

R1

= K940.00

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

R500 X K19.74
R 1

=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 $\frac{3}{4}$ X \$600

=\$450

If \$ 1 = K700

\$450 = more

\$450 X 700
\$1

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 = K950

Total amount converted

= \$ [1,500 + 700]

= \$2,200

If \$ 1=K950

\$2,200=more

\$2,200 X K950

\$1

K (2,200 X 950)

K2,090, 000

EXERCISE 9

- Bertha bought a fridge from South Africa worthy K250,000 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?
- How much money in Euro can a Malawian buy with K732,060.
- Convert K21,950 to Pula.
- A television screen costs R2,150 in South Africa. How much is it in Malawi Kwacha?
- 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 5 kg 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 X K130	=K 650.00
3 bags of charcoal for K2, 500		=K2, 500.00
40 Chambo fish at 2,320 per unit	= 40 X K2320 ÷10	=K9, 280.00
Total bill		<u>=K12,430.00</u>

The balance = K15,000 -K12,430
=2, 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)

10 tomatoes at 2 for K50	= 10 ÷2 X K50	= K250.00
3 books for K500		=K500.00
9 bunches of onion at K175 per 3 bunches	= 9 X K175 ÷3=	=525.00
140 units of books at K99 per unit	=140 X K99 per unit = 140 X K99÷10=	1386.00
Total bill		K2, 661.00

3. A lady bought the following item from a shop
- 75 cm cloth at K120 per metre
- 2 units pens at K15 per pen
- 7 shirts for K4500
- How much change did she get from K 6,000 (8 marks) [2006 Q.32].

Calculations

75cm cloth at K120 per metre =75cmX K120 = K 90. 00



7 shirts for K4, 500 =K4, 500. 00
 2 Units pens at K15 per pen = 2 X10 X K15 =K 300. 00
 Total bill =K4890.00

The change = K6 000 - K4 890
 = K1 110

4. Tina bought a dress at K3,500. Zione made a similar dress from 2 metres piece of cloth at K 750 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 X K750 = K1 500.00
 6 buttons at 3 for K100 =6/3 X K100=K 200.00
 A thread for K60 =K 60.00
 Total bill =K1 760.00

Amount saved=K3500– K1760=K
 1740.00

5. Mphatso bought 5 metres of cloth at K750 per metre, 18 bananas at 3 for K100 and 3 ½ kg rice at K480 per kg. Prepare a bill for Mphatso.(5 marks) [2017 Q. 24]

5 metres of cloth at K750 per metre =5 X K 750 = K3, 750.00
 18 bananas at 3 for K100 =18/3 K100=K 600.00
 3 ½ kg rice at K480 per Kg =7/2 K480 =K1 580.00
 Total bill =K5 930.00

6. 7 loaves of bread at K80.00 each, 3 kg Sugar at K95, per Kg, 13 packets of salt at K18.00 each, 4 litres cooking oil at K186.00 per 1 . Prepare the bill. (4 marks)

Calculations

7 loaves of bread at K80 = 7 X K80 = K560. 00
 3 Kg Sugar at K95 = 3 X K95= K285. 00
 13 Packets of salt at K18 each =13 X 18 = K234. 00
 4 litres cooking oil at K186 each =4 x 186 = K 764. 00
 Total bill =K1,843.00

7. Mrs Zimba had K8,520.00 to buy the following items: 48 pencils at K 18.50 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. Prepare budget for these items and find her change. (8 marks)

Calculations

48 pencils at K18.50 = 48 x K18.50 =K
 888.00

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 X K18.50 = K 888.00
 20 knives at K100 each = 20 X K100 = K2 000.00
 25 rulers for K1 630 =K1, 630.00
 26 bottles of soft drinks at K40 each =26 X K40 =K1,040.00
 30 tablets of soap at K35.50 each = 30 X K35.50 =K1,065.00

Total bill = K 6, 563.00

The change = K8520 – K6563
 = K1 957

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

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

(i) Complete the table



$$\begin{aligned} \text{Amount for cooking oil} &= 3 \times \text{K1200} \\ &= 3600.00 \end{aligned}$$

$$\begin{aligned} \text{Cost for soap} &= \text{K1600} \\ &2 \\ &= \text{K800} \end{aligned}$$

- (ii) Find the total cost for Mama's budget

$$\text{The total cost} = \text{K} (4250 + 3600 + 1600)$$

K9450.00

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

- Prepare a bill for him
 - How much change did he receive after paying K12 500.00?
- Chifundo buys the following items; 1 heap of tomatoes at K25.00 per heap and 3 bundles of onions at K 15.00 per bundle. If he gives a K 500 note . Calculate the correct change he receives.(2003 Q.11).
 - 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.
 - Mr. Phiri bought the following items for his daughter
2 dresses at K250 each
4 exercise books at K45 each

If he paid K 1000, 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 + profit
- Loss = Cost price – selling price
- Cost price = selling price – profit

$$\text{Profit \%} = \frac{\text{Profit} \times 10\%}{\text{Cost price}}$$

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

Note :

- Cost price = 100%
 - Selling price with a profit = 100% + profit
 - Selling price with a loss = 100% - loss
- Find the profit made after selling 10 bales of sugar at K3,000.00 each if each bale was bought at = 10 X K 2 860

$$= 28\ 600$$

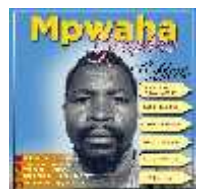
$$\text{Selling price} = 10 \times \text{K3,000}$$

$$= \text{K30\ 000}$$

$$\text{Profit} = \text{selling price} - \text{cost price}$$

$$= 30\ 000 - \text{K28\ 600}$$

$$= \text{K1\ 400}$$



1. Maggie bought 15 mattresses at K9 999.00 each . She sold 12 of them at K10,500 each and the rest at K10,240.00 each. Calculate the total profit she made (4 marks)

$$\text{Cost price} = 15 \times \text{K}9\,999.00 \\ = \text{K}149\,985$$

$$\text{Selling price} = (12 \times \text{K}10\,500) + (3 \times \text{K}10\,240) \\ = \text{K}126\,000 + \text{K}30\,720 \\ = \text{K}156\,720$$

$$\text{Profit} = \text{Selling price} - \text{cost price} \\ = \text{K}156\,720 - \text{K}149\,985 \\ = \text{K}6\,735$$

2. Find the selling price of a bag of fertilizer if it was bought at K5, 820.00 (3 marks)

$$\text{Profit} = \text{K}1\,400$$

$$\text{Selling price} = \text{cost price} + \text{profit} \\ = \text{K}5\,820 + \text{K}1\,400 \\ = \text{K}7\,220.00$$

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)

$$\text{Cost price} = \text{K}1\,800$$

$$\text{Good units} = (24 - 2) \text{ units} \\ = 22 \text{ units}$$

$$\text{Selling price} = 22 \times \text{K}78 \\ = \text{K}1\,716$$

$$\text{Loss} = \text{cost price} - \text{Selling price} \\ = \text{K}1\,800 - \text{K}1\,716 \\ = \text{K}84$$

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

$$\text{Cost price} = \text{K}5\,800$$

$$\text{Selling price} = 4 \times 10 \times \text{K}195 \\ = \text{K}7\,800$$

$$\text{Profit} = \text{Selling price} - \text{Cost Price} \\ = \text{K}7\,800 - \text{K}5\,800 \\ = \text{K}2\,000.00$$

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 680. Find the total profit that Mr. Banda made.(6 marks) [2007 Q.32b)

$$\text{Cost price} = 6 \times \text{K}780 \\ = \text{K}4\,680$$

$$\text{Selling price} = (3 \times \text{K}950) + (2 \times \text{K}1200) + \text{K}680 \\ = \text{K}2850 + \text{K}2\,400 + \text{K}680 \\ = \text{K}5\,930$$

$$\text{Profit} = \text{Selling price} - \text{cost price} \\ = \text{K}5\,930 - \text{K}4\,680 \\ = \text{K}1\,250$$

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

$$\text{(i) Selling price} = \text{cost price} + \text{profit} \\ = 100\% + 4\% \\ = 104\%$$

$$\text{If } 104\% = \text{K}124.00$$

$$100\% = \text{less (cost price)}$$

$$\frac{100\%}{104\%} \times \text{K}124.80$$

$$\text{Cost price} = \text{K}120$$

$$\text{(ii) profit} = \text{Selling price} - \text{Cost price} \\ = \text{K}124.80 - \text{K}120.00 \\ = \text{K}4.80$$



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]

$$\text{Cost Price} = \text{K6 000.00}$$

$$\begin{aligned}\text{Good eggs} &= (240 - 22) \text{ eggs} \\ &= 218 \text{ eggs}\end{aligned}$$

$$\begin{aligned}\text{Selling price} &= 218 \times \text{K30} \\ &= \text{K6 540}\end{aligned}$$

$$\begin{aligned}\text{Profit} &= \text{Selling price} - \text{Cost price} \\ &= \text{K 540} - \text{K6 000} \\ &= \text{K540}\end{aligned}$$

$$\begin{aligned}\text{Profit \%} &= \frac{\text{Profit} \times 100\%}{\text{Cost price}} \\ &= \frac{\text{K540} \times 100\%}{\text{K6 000}} \\ &= 9\%\end{aligned}$$

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]

$$\text{Loss} = \text{K1650}$$

$$\text{Cost price} = \text{K3510}$$

$$\begin{aligned}\text{Selling price} &= \text{cost} - \text{loss} \\ &= 3510 - \text{K1650} \\ &= \text{K1 860}\end{aligned}$$

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

$$\begin{aligned}\text{Cost price} &= \frac{100}{100} \times \text{K126.50} \\ &= 1265.00\end{aligned}$$

$$\text{Profit} = 100 \times 2.5$$

$$= 1265 + \text{K250}$$

$$= \text{K1 515}$$

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]

$$1 \text{ orange} = 20 \text{ t}$$

$$150 \text{ oranges} = \text{more}$$

$$150 \times 20 \text{ t}$$

$$= 3000 \text{ t}$$

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

$$= 30.00$$

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]

$$\text{Cost price} = \text{K300}$$

$$\begin{aligned}\text{Profit} &= 20 \times \text{K5} \\ &= 100\end{aligned}$$

$$\begin{aligned}\text{Selling price} &= \text{cost price} + \text{profit} \\ &= \text{K300} + \text{K100} \\ &= 400\end{aligned}$$

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]

$$\begin{aligned}\text{Selling price} &= (100\% - 30\%) \\ &= 70\%\end{aligned}$$

$$\text{If } 70\% = \text{K4 200}$$

$$\text{Cost price} = \text{more } (100\%)$$

$$100\% \times 4 200$$

$$70\%$$

$$\text{Cost price} = \text{K } (100 \times 60)$$



=K6 000

13. Chipipo bought a box of pencils at K6, 400. She sold them at K7, 040. What was her profit percent?(5 marks)

Cost price = K6 400

Selling price = K7 040

Profit= Selling price – cost price

=7 000 – K6 400

=K640

Profit % = profit X 100%

Cost price

=K640 X 100%

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 % = Loss X 100%

Cost price

=K1 250 X 100%

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)

100% X K46 560

97%

Cost price = K48 000

Loss = Cost price – Selling price

=48 000 – K46 560

=K1 440

16. Tawina made a loss by selling 8 baskets of tomatoes for K1820. If the cost price of each basket was K250.00. Calculate the loss percent(5 marks) [2009 Q 33b]

Selling price = K1 820

Cost price = 8 X K250

=2 000

Loss= cost price – selling price

=K2 000 – K1 820

=K180

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

Cost price

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

K2 000

=9%

17. A trader lost 10% by selling a motor bike 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)

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

90%

Cost price = K 138 888.89 (2 d.p)

To gain 5% =(100 +5)%

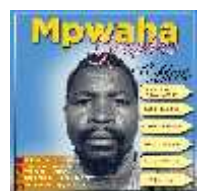
=105 %

If 100%= K138 888.89

105%=more

105% X K138 888.89

100%



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]

$$\begin{aligned}\text{Selling price} &= (100\% - 10\%) \\ &= 90\%\end{aligned}$$

$$\text{If } 90\% = \text{K}10\,800$$

$$100\% = \text{more (CP)}$$

$$100\% \times \text{K}10\,800$$

$$90\%$$

$$= \text{K}12\,000 \text{ (CP)}$$

$$\begin{aligned}\text{To gain } 5\% &= (100 + 5)\% \\ &= 105\%\end{aligned}$$

$$\text{If } 100\% = \text{K}12\,000$$

$$105\% = \text{more}$$

$$\frac{105\%}{100\%} \times \text{K}12\,000$$

$$100\%$$

$$= \text{K}1,260$$

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]

$$\text{Cost price} = \text{K}2\,500$$

$$\text{Selling price} = \text{K}2\,900$$

$$\text{Profit} = \text{Selling price} - \text{Cost price}$$

$$= \text{K}2\,900 - \text{K}2\,500$$

$$= 400$$

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

$$\text{Cost price}$$

$$= \frac{400}{\text{K}2\,500} \times 100\%$$

$$\text{K}2\,500$$

$$= 16\%$$

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]

$$\begin{aligned}\text{Amount lost} &= 6t \times \text{K}500,000 \\ &= 100t\end{aligned}$$

$$= \text{K}(6 \times 5000)$$

$$= 30\,000$$

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]

$$\begin{aligned}\text{Selling price} &= (100\% + 25\%) \\ &= 125\%\end{aligned}$$

$$\text{If } 125\% = \text{K}2\,000$$

$$100\% = \text{less (CP)}$$

$$100\% \times \text{K}2\,000$$

$$125\%$$

$$= \text{K}1\,600$$

14. Tayamika bought 20 mangoes at 4 for 40 t and she sold them at 5 for 60t. What was her profit? (3 marks) [2011 Q12]

$$\begin{aligned}\text{Cost price} &= \frac{20}{4} \times 40t \\ &= 200t\end{aligned}$$

$$\text{K}200t$$

$$\begin{aligned}\text{Selling price} &= \frac{20}{5} \times 60t \\ &= 240t\end{aligned}$$

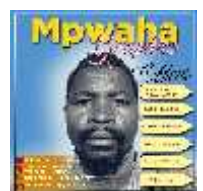
$$\begin{aligned}\text{Profit} &= (240 - 200)t \\ &= 40t\end{aligned}$$

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)

$$\begin{aligned}\text{Selling price} &= (100\% - 10\%) \\ &= 90\%\end{aligned}$$

$$\text{If } 90\% = \text{K}9000$$

$$100\% = \text{more (cost price)}$$



$$\begin{aligned} & 10 \times \text{K}9000 \\ & 90 \\ & = \text{K}10,000.00 \end{aligned}$$

16. A person bought 20 units of fruits for K2000.00 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 \times K50
= K1000

Selling price = profit + cost price

= K1000 + K2000

= 3000 (20 units)

Each fruit = K3000

$$\begin{aligned} & \frac{3000}{20} \\ & = 150 \end{aligned}$$

EXERCISE 11

- Bought 16 crate of soft drinks at K700 per crate and sold them at K800 per crate. Find the total profit made.
- Bertha bought cooking oil at K42,300. He sold it at a profit of 15%. What was his selling price.
- By selling a plot for K149 408, a loss is made at the rate of 8th in the kwacha. Find:
 - The amount lost
 - The cost price of the plot
- Miss Banda sold a drum at K1 996.50. She made a profit of K289.50. Find the cost price of the drum.
- Linda bought 250 bags of ground nuts at K5 500.00 each. If 120 bag were sold at a loss of 150 .00. each. Find the selling price.

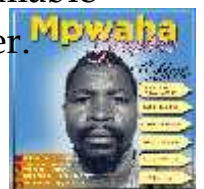
- A school shop buys 100 units of pens for K15,350.40 and sells them at K164 per unit. Find the profit percent.
- Esther bought two 10 litres of cooking oil at K22 500 and sold them at K18 000. Find her loss percent.
- Patricia lost 10% by selling clothes for K150 000. At what price must sold to gain a profit of 5 %.

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Mr. Macheso 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.



Cell :

MANEB KEY

**CORE-ELEMENTS AND THEIR
RESPECTIVE MARKS (HOW
MARKS ARE ALLOCATED
DURIN EXAMINATION)**

1. NUMBERS, OPERATIONS AND RELATIONSHIP (25 marks)

TOPICS FROM STD 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 operation
- HCF
- LCM
- Fractions
- Rate
- Ratio
- Decimals
- Approximation and Estimation

TOPICS FROM STANDARD 7

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

TOPICS FROM STANDRD 8

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

2. ACCOUNTIN AND BUSSINESS 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

- Angels

TOPICS FROM STANDARD 7

- Geometrical shapes

TOPICS FROM STANDARD 7

- Geometrical shapes

TOPICS FROM STANDARD 8

- Constructions
- Scale drawing

4. MEASUREMENTS (20 marks)

TOPICS FROM STANDARD 5

- Length
- Capacity
- Mass
- Area
- Volume

TOPICS FROM STANDARD 6

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

TOPICS FROM STANDRD 7

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

TOPICS FROM STANDARD 8

- Perimetre
- Mass
- Area
- Capacity and Volume
- Temperature

