

P.6 MATHEMATICS LESSON NOTES

TERM TWO

THEME: NUMERACY

TOPIC: FRACTIONS

OPERATIONS OF FRACTIONS

Week 3 lesson 1 and 2

Addition and subtraction of fractions

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

Method 1.

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

$$3 + \frac{8+3}{12} =$$

$$3 + \frac{11}{12}$$

$$3\frac{11}{12}$$

Method 2

$$2\frac{2}{3} + 1\frac{1}{4} = \frac{8}{3} + \frac{5}{4} \quad LCD = 12$$

$$\frac{32+15}{12}$$

$$\frac{47}{12}$$

$$3\frac{11}{12}$$

SW

$$\begin{array}{r} 3 \\ 12 \sqrt{47} \\ -36 \\ \hline 11 \end{array}$$

Subtract

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

$$\frac{19}{5} - \frac{7}{3} \quad LCD = 15$$

$$\frac{57-35}{15}$$

$$\frac{22}{15}$$

$$1\frac{7}{15}$$

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MULTIPLICATION OF FRACTIONS

Week 3 Lesson 2

Multiplication of simple fractions by whole numbers.

$$\frac{1}{3} \text{ Of } 12$$

$$\frac{1}{3} \times 12$$

$$1 \times 4 =$$

$$4$$

$$\text{ii. } 20 \times \frac{3}{5}$$

$$20 \times \frac{3}{5}$$

$$4 \times 3$$

$$=12$$

Multiplication of simple fractions by simple fraction.

$$\frac{2}{3} \times \frac{4}{5} \quad \frac{n \times n}{d \times d}$$

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

$$\frac{8}{15}$$

$$\text{ii. } \frac{2}{9} \times \frac{4}{10}$$

$$\frac{2 \times 4}{9 \times 10}$$

$$\frac{1 \times 4}{9 \times 2} = \frac{4}{18}$$

$$\frac{2}{9}$$

Multiplication of mixed fractions

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

$$\frac{9}{4} \times \frac{5}{3}$$

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

$$\frac{15}{4} \quad \frac{4\sqrt{15}}{3}$$

$$3\frac{3}{4}$$

ii. $6\frac{2}{7}$ of $2\frac{1}{5}$

$$\frac{44}{7} \times \frac{11}{5}$$

$$\frac{44 \times 11}{7 \times 5}$$

$$\frac{484}{35} \quad \frac{13}{35\sqrt{484}} \quad \frac{134}{-105} \quad \frac{29}{29}$$

$$13\frac{29}{35}$$

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DIVISION OF FRACTIONS

Week 3 lesson 4

Division of fractions by whole number.

i. Divide $\frac{2}{3}$ by 4

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

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

$$\frac{1 \times 1}{3 \times 2} = \frac{1}{6}$$

Method 2 using LCM

$$\frac{2}{3} \div \frac{4}{1} \quad LCM = 3$$

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

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

$$\frac{2}{12} = \frac{1}{6}$$

Division of a whole number by a fraction.

How many half kilogram packets are 6kgs?

$$6 \div \frac{1}{2}$$

$$\frac{6}{1} \times \frac{2}{1}$$

$$\frac{6 \times 2}{1 \times 1} = 12$$

OR

$$\frac{6}{1} \div \frac{1}{2} \quad LCM = 2$$

$$(6 \times 2) \div \frac{1}{2} \times 2$$

$$12 \div 1$$

= 12 Half Kg Packets.

Division of fractions by fractions.

Divide

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

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

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

$$\frac{5}{6}$$

Or using LCM

$$\frac{2}{3} \div \frac{4}{5} \quad LCM = 15$$

$$\left(\frac{2}{3} \times 15\right) \div \left(\frac{4}{5} \times 15\right)$$

$$2 \times 5 \div 4 \times 3$$

$$10 \div 12$$

$$\frac{10}{12} = \frac{5}{6}$$

$$\text{ii) } 3\frac{1}{3} \div 2\frac{1}{2}$$

$$\frac{10}{3} \div \frac{5}{2}$$

$$\frac{10}{3} \times \frac{2}{5}$$

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

$$\frac{4}{3} \qquad \frac{1}{3\sqrt{4}} \\ \frac{4}{3} \qquad \frac{-3}{1}$$

$$1\frac{1}{3}$$

OR using LCM

$$3\frac{1}{3} \div 2\frac{1}{2} \quad LCM = 6$$

$$\frac{10}{3} \div \frac{5}{2}$$

$$\left(\frac{10}{3} \times 6\right) \div \left(\frac{5}{2} \times 6\right)$$

$$20 \div 15$$

$$\frac{20}{15} = \frac{4}{3} \quad \begin{array}{r} 1 \\ 3 \overline{) 3} \\ \underline{-3} \\ 1 \end{array}$$

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

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Mixed operation on fractions (Application of BODMAS)

Week 3 lesson 5 and 6

BODMAS – Brackets of Division, Multiplication, Addition, Subtraction.

Simplify

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

BODMAS

$$\frac{2}{3} - \frac{1}{3} \times \left(\frac{3}{5} \times \frac{1}{3} \right) \div \frac{1}{4}$$

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

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

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

$$\frac{2}{3} - \left(\frac{1}{2} \times \frac{4}{5} \right)$$

$$\frac{2}{3} - \frac{2}{5} \quad LCM = 15$$

$$\frac{10-6}{15} = \frac{4}{15}$$

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Word problems (application of fractions)

Week 4 lesson 1

$\frac{2}{3}$ of a number is 40. find the numbers

Soln:

let the number be x

$$\frac{2}{3} \times x = 40$$

$$3 \frac{2x}{3} = 40 \times 3$$

$$\frac{2x}{3} = \frac{120}{2}$$

$$x = 60$$

2. In a class $\frac{2}{5}$ of the pupils are girls. If there are 60 boys in a class. How many girls pupils are in the class?

Let the total No of pupils be x

Fraction for boys

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

$$\frac{5}{2} - \frac{2}{5} = \frac{3}{5}$$

$$\frac{3}{5} \times x = 60$$

$$5 \times \frac{3x}{5} = 60 \times 5$$

$$\frac{3x}{3} = \frac{60 \times 5}{3}$$

$$x = 20 \times 5$$

$$x = 100$$

3. $\frac{1}{4}$ of my salary is sh.15, 000. What is my salary?

Let my salary be m

$$\frac{1}{4} \text{ of } m = \text{shs } 15,000$$

$$\frac{1}{4} \times m = \text{shs } 15,000$$

$$4 \times \frac{m}{4} = \text{shs } 15,000 \times 4$$

$$m = \text{shs } 60,000$$

b). What is $\frac{2}{3}$ of my salary?

$$\frac{2}{3} \times 60,000$$

$$2 \times 20,000$$

$$= \text{Shs } 40,000$$

5. A pupil spent $\frac{1}{6}$ of the pocket money on soda and $\frac{1}{4}$ of the remainder on transport and was left with shs 36,000. How much money did the pupil have at first?

DECIMALS

Converting fractions to decimals

Week 4 lesson 2

i). Express $\frac{1}{2}$ as a decimal.

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

$$\frac{0.5}{2 \sqrt{\frac{10}{-10}}}$$

$$0.5$$

(ii) express $\frac{3}{4}$ as a decimal

$$\frac{3}{4} = \frac{0.75}{1} = \frac{75}{100} = \frac{3}{4}$$

$$= 0.75$$

iii) Express $\frac{1}{3}$ as a decimal

$$\frac{1}{3} = \frac{0.333}{1} = \frac{333}{1000}$$

$$= -0.33\ldots\text{ or }0.3$$

Converting decimals into mixed fractions.

i) Change 0.4 into a common fraction.

$$0.4 = \frac{4}{10}$$

$$\frac{4 \div 2}{10 \div 2} = \frac{2}{5}$$

ii) Change 0.025 into a common fraction

$$0.025 = \frac{25}{1000} = \frac{1}{40}$$

OPERATION OF DECIMALS

Week 4 lesson 3

Addition and subtraction of decimals.

i) Add 8.6 + 0.9

$$\begin{array}{r} 8.6 \\ +0.9 \\ \hline 9.5 \end{array}$$

ii) Subtract 0.46 from 2

$$\begin{array}{r} 2.00 \\ -0.46 \\ \hline 1.54 \end{array}$$

iii) Work out: $5.8 - 2.44 + 1.6$

$$(5.8 + 1.6) - 2.44$$

$$7.4 - 2.44$$

$$\begin{array}{r} 7.40 \\ -2.44 \\ \hline 5.96 \end{array}$$

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MULTIPLICATION OF DECIMALS

Week 4 lesson 4

a. Multiplying a decimal by 10, 100 and 1000

Example:

i. 0.23×10

$$\frac{23}{100} \times 10$$

$$\frac{23}{10} = 2.3$$

ii. 0.761×100

$$\frac{761}{1000} \times 100$$

$$\frac{671}{10} = 76.1$$

iii. 0.467×1000

$$\frac{467}{1000} \times 1000$$

$$= 467$$

a. Multiply a decimal by a whole number

i. Example:

$$0.32 \times 4 \quad \text{or} \quad 0.32 \times 4$$

$$0.32 \quad \frac{32}{100} \times 4$$

$$\times 4 \quad \frac{32}{100} \times 4 = \frac{128}{100}$$

$$1.28 \quad 1.28$$

ii. 3.75×18 or 3.75×18

$$\begin{array}{r} 375^{OR} \\ \times 18 \\ \hline 3000 \\ + 875 \\ \hline 6750 \\ 67.50 \end{array} \quad \frac{375}{100} \times 18$$

$$\frac{375}{100} \times 18$$

$$\frac{6750}{100} = 67.5$$

Multiplying a decimal by a decimal

1. Simplify 0.7×0.5

Method

$$0.7 \times 0.5$$

$$\frac{7}{10} \times \frac{5}{10} = \frac{7 \times 5}{10 \times 10}$$

$$\frac{35}{100} = 0.35$$

Method 2

$$0.7 \times 0.5$$

$$7 \times 5$$

$$.35$$

$$0.35$$

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DIVISION OF DECIMALS

Week 4 lesson 5

Division of whole numbers by decimals.

Example

a. $8 \div 0.2$

$$8 \div \frac{2}{10}$$

$$8 \times \frac{10}{2}$$

$$4 \times 10$$

$$40$$

b. Divide $24 \div 0.03$

$$24 \div \frac{3}{100}$$

$$8 \times 100$$

$$800$$

Division of decimals by a whole number.

a) Divide $1.2 \div 0.6$

$$\frac{12}{10} \times \frac{6}{10}$$

$$\frac{12}{10} \times \frac{10}{6} = 2$$

b) Divide $0.036 \div 0.4$

$$\frac{36}{100} \div \frac{4}{10}$$

$$\frac{36}{1000} \times \frac{10}{4}$$

$$\frac{9}{100}$$

$$0.09$$

Multiplication and division of decimals

a) Simplify

$$\frac{0.24 \times 0.3}{0.8}$$

$$\left(\frac{24}{100} \times \frac{3}{10} \right) \div \left(\frac{8}{10} \right)$$

$$\frac{24}{100} \times \frac{3}{10} \times \frac{10}{8}$$

$$\frac{3 \times 3 \times 1}{100 \times 1}$$

$$\frac{9}{100} = 0.09$$

b) Work out:

$$\frac{0.9 \times 0.14}{0.2 \times 0.3}$$

$$\frac{9}{10} \times \frac{14}{100} \div \left(\frac{2}{10} \times \frac{3}{10} \right)$$

$$\frac{9^3}{10} \times \frac{14^7}{100} \times \frac{10}{2} \times \frac{10}{3}$$

$$\frac{3 \times 7}{10}$$

2.1

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Changing recurring decimals into common fractions. (Week 5 lesson 1 and 2)

i) Change 0.33..... to a common fraction

Solution:

Let the fraction be x

$$x = 0.33 \dots \dots \dots (i)$$

Multiply each side by 10 since one digit is recurring

$$x \times 10 = 0.33 \dots \dots \dots \times 10$$

$$10x = 3.33 \dots \dots \dots (ii)$$

Subtract (i) from (ii)

$$\begin{array}{r} 10x = 3.33 \dots \dots \dots \\ - x = 0.33 \dots \dots \dots \\ \hline 9x = 3 \\ \frac{9x}{9} = \frac{3}{9} \end{array}$$

$$x = \frac{3}{9}$$

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

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RATIOS AND PROPORTIONS (Week 5 lesson 3)

Ratio is the comparison between two or more quantities of the same units.

EXPRESSING RATIOS AS FRACTIONS.

- i) Express 1:2 as a fraction

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

- ii) Express 5:3 as a fraction

$$5:3 = \frac{5}{3}$$

EXPRESSING FRACTIONS AS A RATIO

Express $\frac{1}{2}$ as a fraction

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

Express $\frac{6}{5}$ as a ratio

$$\frac{6}{5} = 6:5$$

Week 5 lesson 4

EXPRESSING QUANTITIES AS RATIOS (*Note: Ratios are expressed without units*)

- (i) Henry has 12 books and John has 20 books. What is the ratio of Henry's books to John's books?

$$12:20$$

$$\frac{12}{20} = \frac{3}{5}$$

3:5

(ii) Express 20 minutes as a ratio of 1 hour.

1 hour = 60 minutes

quantities

20 min: 60 min

term and

$$\frac{20}{60} = \frac{2}{6}$$

1:3

NB Ratios that are to compare two

must be expressed to the lowest

must be of the same units.

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SHARING IN RATIOS. Week 5 lesson 5

1. Divide sh 120 in a ration of 1:4

Total share $1 + 4 = 5$ parts.

1st share: $\frac{1}{5} \times 120$

= sh. 24

2nd share $\frac{4}{5} \times \text{sh } 120$

$4 \times 24 = 96$

Method 2

Total share $1 + 4 = 5$ parts

4 parts

5 parts rep shs 120

4 parts rep $\frac{120}{5} \times 4$

1 part rep sh. $\frac{120}{5}$

24×4

Sh. 24

sh.96

2. John and Diana shared sh. 3000 in a ratio of 2:3 respectively. How much did each get?

John : Diana or john : Diana

2 : 3 2 : 3

Total ratio 2+3 total ratio. 2+3 = 5

=5 5 parts rep sh. 3000

John's share 1 part rep sh. $\frac{3000}{5}$

$\frac{2}{5} \times \text{shs } 3000$ 1 part rep. sh.600

Shs 1200

John's share

Diana's share

Diana's share

2 parts

3 parts

$\frac{3}{5} \times \text{shs } 3000$ 2×600 3×shs600

Shs 1800

shs 1200

shs 1800

INCREASE AND DECREASE IN RATIOS (week 5 lesson 6)

Example

1. Increase 200/= in the ratio of 5:4

New: Old or New: old

5: 4 5:4

? 200 $\frac{\text{New}}{\text{Old}} \times \text{Quantity}$

4 parts rep 200/= $\frac{5}{4} \times \text{shs } 200$

$$1 \text{ part reps } \frac{200}{4} =$$

$$5 \times \text{shs } 50$$

$$50 =$$

$$\text{sh. } 250$$

$$5 \text{ parts rep } 5 \times 50 =$$

$$\text{Sh. } 250$$

Decrease 400 in a ratio of 3:4

New: old

or

new: old

$$3: 4$$

$$3:4$$

$$? \text{ } 400$$

$$\frac{\text{new}}{\text{old}} \times \text{Quantity}$$

$$4 \text{ parts rep } 400$$

$$\frac{3}{4} \times 400 = 100$$

$$1 \text{ part rep } \frac{400}{4}$$

$$3 \times 100$$

$$100$$

$$300$$

$$3 \text{ parts rep } \frac{400}{4} \times 3$$

$$100 \times 3$$

$$300$$

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SOLVING PROBLEMS INVOLVING RATIOS (week 6 lesson 1 and 2)

1. Dan and Mike shared some money in the ratio of 3:5 respectively. If Mike got sh.3000,

a) How much did Dan get?

Dan : Mike

3 : 5

? 3000/=

5 parts rep. 3000/=

1 part reps $\frac{3000}{5}$

3 parts rep $\frac{3000^{600}}{5} \times 3$

Shs 600×3

Shs 1800

Dan got shs 1800

Dan : Mike

3 : 5

Total ratio 3+5 = 8

let total share by y

$\frac{5}{8} \times y = shs\ 3000 \times 8$

$8 \times \frac{5y}{8} = \frac{shs\ 3000^{600} \times 8}{5}$

$y = 4800/=$

Dan's share = $\frac{3}{8} \times 4800^{600} /=$

$3 \times 600/=$

1800/=

2. A and B shares a sum of money in a ratio of 3:4. If A gets shs 12000, how much money is shared?

A : B

or

A : B

3 : 4

3 : 4

12000/=

Total ratio 3+4 = 7

Total No of parts (total ratio)

let the total amount be

y

$3+4 = 7$

$\frac{3}{7} \times y = shs\ 12000$

3 parts rep shs 12000

$7 \times \frac{3y}{7} = shs\ 12000 \times 7$

1 part rep shs $\frac{12000^{4000}}{3}$

$3y = shs\ 12000 \times 7$

7 parts rep 4000×7

$\frac{3y}{3} = shs\ \frac{12000^{4000}}{3} \times 7$

$$= 28000/=$$

$$y = 28,000/=$$

3. A, B and C shared a certain sum of money in the ratio of 2:3:5 respectively. If C got sh.1500 more than A. how much money is shared?

A: B: C

2:3:5

Total ratio

$$2+3+5 = 10$$

Difference in ratio

$$5-2 = 3$$

3 parts rep 1500/=

$$1 \text{ part reps } \frac{1500/=}{3}$$

$$10 \text{ parts rep } \frac{1500 \times 10}{3}$$

$$500 \times 10$$

$$5000/=$$

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PROPORTIONS (week 6 lesson 3 and 4)

NB: In proportions, the required quantity is always on the right hand side.

Example:

1. 2 books cost sh. 200, what is the cost of 6 books

Books		cost
2 books	cost	200/=
1 book	costs	$\frac{200 \text{ /=}}{2}$
6 books	costs	sh.100×6
		Sh.600

2. 6 books cost sh.1200. How many books can 1 buy with sh. 600?

Cost		books
Shs 200	buys	6 books
1 shs	buys	$\frac{6 \text{ books}}{1200}$
Shs 600	buys	$\frac{6}{1200} \times 600$
		3 books

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INDIRECT (INVERSE PROPORTIONS)

Example:

1. 4 girls take 9 days to do a job. How long will 12 girls take to do the job at the same rate?

Girls	Days
4 girls take	9 days
1 girl takes	9×4

12 girls take $\frac{9 \times 4}{12} = 3 \times 1$

3

2. 12 men can build a classroom in 5 days. How many men are needed to do the whole job in 2 days?

Day's		men
5 days	need	12 men
1 day	needs	12×5 men
2 days	need	$\frac{12 \times 5}{2}$
		6×5
		30 men

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PERCENTAGES (week 6 lesson 5)

Percent means out of 100.

Percent means every 100

Percent means per 100

Symbol for percentage %

EXPRESSING PERCENTAGES FRACTIONS

- i. Express 60% as a fraction

$$60\% = \frac{60}{100}$$

$$\frac{6 \div 2}{10 \div 2} = \frac{3}{5}$$

ii. Express 13% as a fraction

$$13\% = \frac{13}{100}$$

iii. Change $12\frac{1}{2}\%$ as a percentage

$$= 12\frac{1}{2}\% = \frac{25\%}{2}$$

$$\frac{25\%}{2} \div 100$$

$$\frac{25}{2} \times \frac{1}{100}$$

$$\frac{25}{200} = \frac{1}{8}$$

EXPRESSING PERCENTAGE TO DECIMALS

1. Change 40% into a decimal

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

$$0.4$$

2. Convert 35% into a decimal

$$35\% = \frac{35}{100}$$

$$0.35$$

3. Convert $12\frac{1}{2}\%$ into a decimal

$$12\frac{1}{2}\% = \frac{25}{2}\%$$

$$= \frac{25}{2} \div 100$$

$$\frac{25}{2} \times \frac{1}{100}$$

$$= \frac{25}{200}$$

$$\begin{array}{r}
 0.125 \\
 8\sqrt{10} \\
 -8 \\
 \hline
 20 \\
 -16 \\
 \hline
 40 \\
 -40 \\
 \hline
 0
 \end{array}$$

0.125

EXPRESSING PERCENTAGES AS A DECIMALS RATIOS

i) Convert 40% as a ratio

$$40\% = \frac{40}{100} = \frac{2}{5}$$

2:5

ii) Convert 29% as a ratio

$$29\% = \frac{29}{100}$$

= 29:100

iii) Change $12\frac{1}{2}\%$ as a ratio

$$12\frac{1}{2}\% = \frac{25}{2}\%$$

$$\frac{25}{2} \div 100$$

$$\frac{25}{2} \times \frac{1}{100}$$

$$\frac{1}{8} = 1:8$$

EXPRESSING FRACTIONS AS A PERCENTAGES (week 6 lesson 6)

i. Convert $\frac{1}{2}$ as a percentage

$$\frac{1}{2} = \frac{1}{2} \times 100\%$$

50%

ii. Convert $\frac{1}{3}$ into a percentage

$$\frac{1}{3} \times 100\% = \frac{100}{3}\%$$

Convert $\frac{1}{3}$ into a percentage.

$$\frac{1}{3} \times 100\% = \frac{100\%}{3}$$

$$\begin{array}{r} 33 \\ 3 \overline{)100} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

$$= 33\frac{1}{3}\%$$

EXPRESSING DECIMALS AS PERCENTAGES

i) Convert 0.04 as a percentage

$$\begin{aligned} 0.04 &= \frac{4}{100} \times 100\% \\ &= 4\% \end{aligned}$$

ii) Change 1.2 into a percentage

$$\begin{aligned} 1.2 &= \frac{12}{10} \times 100\% \\ &= 120\% \end{aligned}$$

EXPRESSING RATIOS AS PERCENTAGES

1. Change 2:5 into a percentage

$$\begin{aligned} 2:5 &= \frac{2}{5} \times 100\% \\ &= 2 \times 20\% \\ &= 40\% \end{aligned}$$

2. Change 2:7 into a percentage

$$\begin{aligned} 2:7 &= \frac{2}{7} \times 100\% \\ &= \frac{200\%}{7} \\ &= 28 \frac{4}{7} \end{aligned}$$

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PARTS OF PERCENTAGE. (Week 7 lesson 1)

N.B total percentage is 100%

Examples

1. In a class 40% are boys and the rest are girls. Find the percentage for girls.

Total percentage = 100%

% for = 40%

% for girls = 100% - 40%

= 60%

2. In the school library 40% of the books are science text books, 20% are math, 5% are SST and the rest are English text books.

Find the percentage of English text books

Total percentage = 100%

Total percentage of math, science, SST text books =

40% + 20% + 5%

= 65%

Percentage of English text books = 100% - 65%

= 35%

3. Musisi Covered 30% of his journey by car and 50% by bus.

What percentage of the journey was left?

Entire journey = 100%

Musisi traveled = 30% + 50%

= 80%

Percentage left = 100% - 80%

= 20%

COMPARING QUANTITIES USING PERCENTAGES

1. There are 20% more boys than girls in the class. What is the percentage of

a) Boys b) girls

Total percentage = 100%

Let the girls' percentage be $x\%$

Girls	boys	total
$x\%$	$x+20\%$	= 100%

$x\% + \% + 20\% = 100\%$

$2x\% + 20\% = 100\%$

$2x\% + 20\% - 20\% = 100\% - 20\%$

$\frac{2x}{2} = \frac{80\%}{2}$

$x\% = 40\%$

Percentage of girls = 40%

Percentage for boys = $x\% + 20\%$

= $40\% + 20\%$

= 60%

2. A family spent 40% more on school fees than clothing. What percentage is spent on clothing?

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EXPRESSING QUANTITIES AS PERCENTAGES (week 7 lesson 2 and 3)

Express 20 as a percentage of 80

$\frac{20}{80} \times 100\%$

$1 \times 25\%$

= 25%

2. A bag contains 18 blue pens and 32 red pens.

What is the percentage of the blue pens and the red pens?

$$\text{Total no. of pens} = 18 + 32 =$$

$$= 50$$

$$\% \text{ of red pens} = \frac{32}{50} \times 100\%$$

$$= 32 \times 2\%$$

$$= 64\%$$

3. Express 200grams as a percentage of 2kg

$$1\text{kg} = 1000\text{gm}$$

$$2\text{kg} = 2 \times 1000\text{gm}$$

$$= 2000\text{gm}$$

$$\frac{200\text{gm}}{2000\text{gm}} \times 100\%$$

$$= 10\%$$

MK primary MTC Bk 6 pg

Understanding MTC Bk 6 pg functional primary MTC bk 6 pg

FINDING PERCENTAGE PARTS OF QUANTITIES (week 7 lesson 4)

Example

1. Find 40% of 150

$$\frac{40}{100} \times 150$$

$$4 \times 15$$

$$60$$

20% of 1kg

$$1\text{kg} = 1000\text{gm}$$

$$= \frac{20}{100} \times 1000\text{gm}$$

$$= 200\text{gm}$$

2. A piece of land is 200 hectares. A farmer used 60% of it to cultivate. How much land is used for cultivation?

60% of 200 hectares

$$\frac{60}{100} \times 200 \text{ hectares}$$

120 hectares

3. What is $12\frac{1}{2}\%$ of 800kg

$$\frac{12\frac{1}{2}}{100} \times 800 \text{ kg}$$

$$12\frac{1}{2} \times 8 \text{ kg}$$

$$\frac{25}{2} \times 8 = 25 \times 4$$

100Kg

MK primary MTC bk 6 pg 146

Understanding MTC bk 6 pg 118

Functioning primary MTC bk 6 pg 107

MORE ABOUT PERCENTAGE PART OF QUANTITIES.

1. A school has 800 pupils 45% are girls and the rest are boys.

a) How many girls are in the school?

$$\% \text{ for girls} = 45\%$$

$$\text{No. of girls} = \frac{45}{100} \times 800$$

$$= 45 \times 8$$

$$= 360 \text{ pupils}$$

b) How many boys are in the class?

Method 1

$$\text{Total no. of pupils} = 800$$

$$\text{No. of girls} = 360$$

method 2

$$\text{total percentage} = 100\%$$

$$\% \text{ for girls} = 45\%$$

$$\begin{aligned}\text{No. of boys} &= 800 - 360 \\ 45\%\end{aligned}$$

$$440\text{boys}$$

$$\% \text{ for boys} = 100\% -$$

$$= 55\%$$

$$= \frac{55}{100} \times 800$$

$$\text{No. of boys} = 440$$

2. In a class, 10% of the pupils are absent. How many pupils are present if there are 60 pupils?

$$\text{No. of pupils absent} = \frac{10}{100} \times 60 \text{ pupils}$$

$$= 6 \text{ pupils}$$

$$\text{No. of pupils present} = 60 - 6$$

$$= 54 \text{ pupils}$$

MK primary mathematics Bk 6 pg

MORE PROBLEMS INVOLVING PERCENTAGES. (WEEK 7 LESSON 5 and 6)

1. If 10% Of a number is 40. What is the number?

Let the no. be x

$$10\% \text{ of } x = 40 \qquad 10\% \quad \text{rep} \quad 40$$

$$\frac{10}{100} \times x = 40 \qquad 1\% \quad \text{rep} \quad \frac{40}{10}$$

$$100 \times \frac{10x}{100} = 40 \times 100 \qquad 100\% \quad \text{rep} \quad \frac{40}{10} \times 100$$

$$\frac{10x}{10} = \frac{4000}{10} \qquad 400$$

$$x = 400$$

2. 20% of the pupils in a school are girls. There are 35 girls in the school. How many pupils are there in the school?

Let the no. of pupils be y

20% of y	=	35	20% rep	35pupils
$\frac{20}{100} \times y$	=	35	1% rep	$\frac{35}{20}$
$100 \times \frac{20y}{100}$	=	35×100	100% rep	$\frac{35}{20} \times 100$
$\frac{20y}{20}$	=	$\frac{3500}{20}$		35×5
y	=	175pupils		175 pupils

PERCENTAGE INCREASE (week 8 lesson 1)

Increase means to add on.

1. Increase sh 800 by 20%

Original	+	increment	new percentage
Sh 800	+	(20% of sh 800)	100% +20% =
120%			
Sh 800	+	$\frac{20}{100} \times 800$	120 % of the original
Sh 800	+	160	$\frac{120}{100} \times 800$
Sh 960			120 ×8 sh
			Sh 960

2. Increase 400 by 15%

Sh 400	+	(15% of sh400)	(100% +15%)
of 4000			
Sh400	+	$\frac{15}{100} \times 400$	115 % of 400
Sh400	+	60	$\frac{115}{100} \times 400$
Sh 460			115 ×4 sh
			Sh 460

3. A shirt used to cost 10,000 shilling. This price increased by 5%. Calculate the new price of the shirt

MK primary MTC BK 6 pg 153

Understanding MTC Bk 6 pg 121

Functioning primary MTC Bk 6 pg 110

Primary MTC for Uganda Bk 6 pg 58

PERCENTAGE DECREASE (Week 8 lesson2)

Decrease means to reduce, subtract, deduct

1. Decrease 300 by 10 %

300	-	(10% of 300)	100% - 10% of 300
300	-	$\frac{10}{100} \times 300$	$\frac{90}{100} \times 300$
300	-	30	90 × 3
270			270

2. Decrease sh 1500 by 20%

100% - 20% of sh 1500

$$\frac{80}{100} \times \text{sh}1500$$

$$80 \times 15$$

Sh 1200

3. The number of pupils decreased by 15%. How many pupils are in the school if they were 1600 pupils?

4. Reduce 1800kg by 40%

MK primary MTC Bk pg 155, Understanding MTC bk 6 pg 121

PERCENTAGE PROFIT / GAIN (week 8 lesson3)

Profit = selling price – buying price (Cost price)

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

Example.

1. An article was bought at sh 100,000 and sold at sh 120,000. Calculate the percentage profit

$$\begin{aligned} \text{Profit} &= \text{S.P} - \text{B.P} \\ &= \text{sh } 120,000 - 100,000 \\ &= \text{sh } 20,000 \end{aligned}$$

$$\begin{aligned} \text{Percentage profit} &= \frac{\text{sh } 20,000}{\text{sh } 100,000} \times 100\% \\ &= 20\% \end{aligned}$$

2. The gain from the sales of certain items is sh 6000. The items were bought at sh 48,000

Calculate the percentage gain

$$\begin{aligned} \text{Percentage gain} &= \frac{\text{gain}}{\text{B.P}} \times 100\% \\ &= \frac{\text{sh } 6000}{\text{sh } 48000} \times 100\% \\ &= \frac{600\%}{48} \\ &= \frac{50}{4} \\ &= 12\frac{2}{4}\% \end{aligned}$$

3. A book was bought at sh 800 and was sold at sh 900. Calculate the percentage profit.

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

$$\text{Sh } 900 - \text{sh } 800$$

$$\text{Sh } 100$$

Find the percentage profit made

$$\% \text{ percentage} = \frac{\text{profit}}{\text{B.P}} \times 100\%$$

$$= \frac{\text{sh } 100}{\text{sh } 800} \times 100\%$$

$$= \frac{25}{2}$$

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

$$\begin{array}{r} 12 \\ 2 \overline{) 25} \\ \underline{-2} \\ 5 \\ \underline{-4} \\ 1 \end{array}$$

PERCENTAGE LOSS (week 8 lesson 4)

The following words can also be used to mean decrease or loss. They are discount and reduction.

Loss = buying price – selling price.

$$\text{Percentage loss} = \frac{\text{loss}}{\text{B.P}} \times 100\%$$

1. Juman bought a book at shs 400 and sold it at shs 300

a) Calculate the loss he made.

$$\begin{aligned} \text{Loss} &= \text{buying price} - \text{selling price} \\ &= \text{Shs } 400 - \text{shs } 300 \\ &= \text{Shs } 100 \end{aligned}$$

b) Find the percentage loss he made.

$$\begin{aligned} \% \text{ loss} &= \frac{\text{loss}}{\text{B.P}} \times 100\% \\ &= \frac{100}{400} \times 100\% \\ &= \frac{100\%}{4} \\ &= 25\% \end{aligned}$$

2. A trader bought an item at sh 5000, on selling it he made a loss of sh 2000. Calculate the percentage loss he made

$$\begin{aligned} \text{Percentage loss} &= \frac{\text{loss}}{\text{B.P}} \times 100\% \\ &= \frac{2000}{5000} \times 100\% \\ &= \frac{200}{5} \\ &= 40\% \end{aligned}$$

MORE ABOUT PERCENTAGE PROFIT AND LOSS

1. A trader bought a radio at shs 20000 and on selling it he made a profit of 30%. How much did he sell the radio?

Method 1		OR	=	100% + 30%
Profit made			=	130%
%profit	=	30%		= 130% of B.P
Profit	=	30% of B.P		= $\frac{130}{100} \times 20000$
	=	$\frac{30}{100} \times 20000$		= sh200 × 130
	=	shs 6000		= sh 26000

$$\begin{aligned}\text{Selling price} &= \text{B.P} + \text{profit} \\ &= \text{sh } 2000 + \text{sh } 6000 \\ &= \text{sh } 26000\end{aligned}$$

2. On selling an article a trader made a loss of 10%. If he bought the article at sh 20000

a) How much was the loss?

$$\begin{aligned}\% \text{ loss} &= 10\% \\ \text{Loss} &= 10\% \text{ of B.P} \\ &= \frac{10}{100} \times 20000 \\ &= \text{sh } 2000\end{aligned}$$

b) Calculate the selling price of the article

$$\begin{aligned}\text{S.P} &= \text{B.P} - \text{loss} \\ 10\% &= \text{sh } 20000 - 2000 \\ &= \text{sh } 18000\end{aligned}$$

20000

$$\begin{aligned}\text{OR S.P} &= \text{B.P} - \text{loss} \\ &= 100\% - 10\% \\ &= 90\% \\ &= \frac{90}{100} \times 20000 \\ &= \text{sh } 18000\end{aligned}$$

Understanding MTC book 6 page 124

Primary MTC for Uganda book 6 page 75

SIMPLE INTEREST (week 8 lesson 5)

N.B the money banked, borrowed or lent is the principal (p)

The percentage used to calculate interest is the rate (R)

The period in a year that the principal is invested is the time (T)

Simple interest = principal $\times$ Rate $\times$ Time

$$S.I = P \times R \times T$$

N.B always the rate is in percentages

$$\text{Amount} = \text{principal} + \text{interest.}$$

Example:

1. A farmer deposited sh 120,000 in a bank that offers an interest rate of 10% per year. How much interest will the farmer get in 2 years?

$$\begin{aligned}\text{Interest} &= P \times R \times T \\ &= \text{sh } 120,000 \times 10\% \times 2 \\ &= \text{sh } 120,000 \times \frac{10}{100} \times 2 \\ &= \text{sh } 24,000\end{aligned}$$

2. A trader borrowed sh 400,000 from a bank at an interest rate of 5% per annum.

a) How much interest must he pay after 6 months?

$$\begin{aligned}I &= P \times R \times T \\ &= \text{sh } 400,000 \times 5\% \times \frac{6}{12} \text{ yrs} \\ &= \text{sh } 400,000 \times \frac{5}{100} \times \frac{6}{12} \text{ yrs} \\ &= \text{sh } 2000 \times 5 \\ &= \text{sh } 10,000\end{aligned}$$

B) What amount will the trader pay altogether?

$$\begin{aligned}\text{Amount} &= \text{principal} + \text{interest} \\ &= \text{sh } 400,000 + \text{sh } 10,000 \\ &= \text{sh } 410,000\end{aligned}$$

MK primary MTC book 6 page 158

Understanding MTC book 6 page 128

Functional primary MTC book 6 page 112

FINDING THE RATE, TIME, AND PRINCIPAL (week 8 lesson 6)

1. Sarah deposited sh 50,000 on her savings account. At the end of 3 years the simple interest earned was sh 15,000. Calculate the rate of interest.

$$P \times R \times T = I$$

$$\text{Sh } 50000 \times \frac{R}{100\%} \times 3 = 15,000$$

$$\frac{150,000R}{100} = 15,000$$

$$\frac{1500R}{1500} = \frac{15000}{1500}$$

$$R = 10\%$$

2. What sum of money will yield an interest of 6000 at 5% for 3 years?

$$P \times R \times T = I$$

$$P \times 5\% \times 3 = \text{sh } 6000$$

$$P \times \frac{5}{100} \times 3 = \text{sh } 6000$$

$$P \times \frac{15}{100} = \text{sh } 6000$$

$$100 \times \frac{15P}{100} = \text{sh } 6000 \times 100$$

$$\frac{15P}{15} = \frac{60,000}{15}$$

$$P = \text{sh } 40,000$$

3. In what time will sh 12000 yield an interest of sh 1800 at 5% per year

$$P \times R \times T = I$$

$$\text{Sh } 12000 \times 5\% \times T = \text{sh } 1800$$

$$\text{Sh } 12000 \times \frac{5}{100} \times T = \text{sh } 1800$$

$$\text{Sh } 120 \times 5 \times T = \text{sh } 1800$$

$$\frac{\text{Sh } 600 \times T}{\text{Sh } 600} = \frac{\text{sh } 1800}{\text{sh } 600}$$

$$T = 3 \text{ years}$$

Mk primary MTC book 7 pages 138/142

Understanding MTC book 6 page 130

Functional primary MTC book 6 page 114

Primary MTC for Uganda book 6 page 75

THEME: INTERPRETATION OF GRAPHS AND DATA.

TOPIC: DATA HANDLING. (week 9 lesson 1 and 2)

MEAN, MEDIAN, MODE, AND RANGE.

$$\text{Mean} = \frac{\text{sum of items}}{\text{No. of items}}$$

Median is the middle number after arranging the data in ascending or descending order.

Example

Find the median of 4,2,6,7,8,9,3

$$= 2,3,4,6,7,8,9$$

$$\text{Median} = 6$$

Mode is the number/ figure/ score that appears more than the rest.

Or the number/ score with the highest frequency.

Example

Find the mode of 8,2,6,4,2,1,2

Number	tallies	frequency
8	I	1
2	III	3
6	I	1

4	I	1
1	I	1

Mode is 2

Modal frequency is the number of times the mode has appeared.

Range is the difference between the highest and the lowest score.

Example.

Given the following 2,4,6,7,8,3

Find the range.

$$\begin{aligned}\text{Range} &= H - L \\ &= 8 - 2 \\ &= 6\end{aligned}$$

Mean is the result you get after dividing the sum of items by the number of items. It is also referred to as average or arithmetic mean.

$$\text{Mean} = \frac{\text{sum of items}}{\text{No. of items}}$$

1. Find the mean of 2, 4, 7, 2, 8 and 1

$$\begin{aligned}\text{Mean} &= \frac{\text{sum of items}}{\text{No. of items}} \\ &= \frac{2+4+7+2+8+1}{6} \\ &= \frac{24}{6} \\ &= 4\end{aligned}$$

2. Find the mean of 6, 4, 2a, 3a, and 5

$$\begin{aligned}\text{Mean} &= \frac{\text{sum of items}}{\text{No. of items}} \\ &= \frac{6+4+2a+3a+5}{5} \\ &= \frac{6+4+5+2a+3a}{5}\end{aligned}$$

$$\frac{15+5a}{5}$$

$$\frac{15}{5} + \frac{5a}{5}$$

$$= 3 + a \quad \text{or} \quad a + 3$$

3. Find the average of $4x + 1$, $5x$ and 14

$$\begin{aligned} \text{Average} &= \frac{\text{sum of items}}{\text{No. of items}} \\ &= \frac{(4x+1) + 5x + 14}{3} \\ &= \frac{4x + 5x + 1 + 14}{3} \\ &= \frac{9x + 15}{3} \\ &= \frac{9x}{3} + \frac{15}{3} \\ &= 3x + 5 \end{aligned}$$

Understanding MTC bk 6 pg 154

PROBLEMS ON AVERAGE.

1. The average of 3 numbers is 12. What is the sum of the three numbers.

$$\text{Average} = \frac{\text{sum of items}}{\text{No. of items}}$$

$$\frac{12}{1} = \frac{\text{sum of items}}{3}$$

$$12 \times 3 = \text{sum of items}$$

$$36 = \text{sum of items.}$$

2. The average of 3, 0, 7 and x is 4 what is the value of x .

$$\text{Average} = \frac{\text{sum of items}}{\text{No of items}}$$

$$\frac{3+0+7+x}{4} = \frac{4}{1}$$

$$\frac{10+x}{4} = \frac{4}{1}$$

$$10 + x = 16$$

$$10 - 10 + x = 16 - 10$$

$$x = 6$$

3. The average age of 3 people is 18 years. The average age of 2 of them is 15 years, how old is the third person?

MORE ABOUT AVERAGE, MEAN, MEDIAN, MODE, MODAL FREQUENCY AND RANGE. (week 9 lesson 3 and 4)

The table below shows the age of children

Age in years	9	11	12	13	8
Number of children	2	1	4	1	1

a) How many children were recorded in the table?

$$2 + 1 + 4 + 1 + 1$$

9 children.

b) Find the modal age

Modal age is 12

c) Find the range

$$\text{Range} = H - L$$

$$= 18 - 9$$

$$9$$

d) Find the mean

$$\begin{aligned}
 \text{Mean} &= \frac{\text{sum of items}}{\text{no. of items}} \\
 &= \frac{(9 \times 2) + (11 \times 1) + (12 \times 4) + (13 \times 1) + (18 \times 1)}{2 + 1 + 4 + 1 + 1} \\
 &= \frac{18 + 11 + 48 + 13 + 18}{9} \\
 &= \frac{108}{9} \\
 &= 12
 \end{aligned}$$

e) Median 9, 9, 11, 12, 12, 12, 12, 13, 18

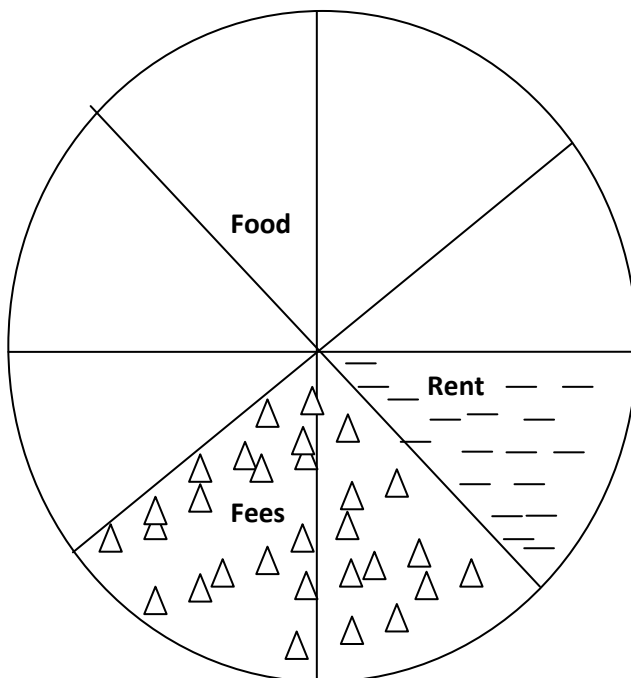
Median = 12

PIE- CHARTS (week 9 lesson 5 and 6)

A Pie- chart is also known as a circle graph.

It represents one complete whole in terms of fractions, 360 in terms of angles and 100 in terms of percentages.

The pie- chart shows how a man spends sh. 24000.



a) What fraction of his money is spent on food?

$$\frac{5}{8}$$

b) How much does he spend on;

i) Food = $\frac{5}{8} \times 24000$

$$= 15000$$

i) fees = $\frac{2}{8} \times 24000$

$$= 6000$$

c) Find the angle sector for rent.

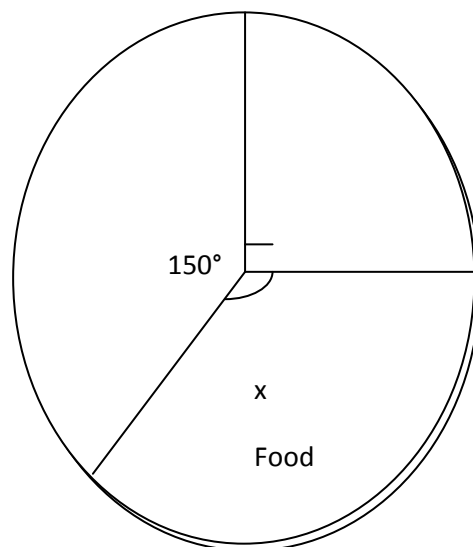
Rent = $\frac{1}{8} \times 360^\circ$

$$= 45^\circ$$

Learning MTC Bk 6 pg 107

PIECHARTS INVOLVING DEGREES

The pie chart below shows Mugisha's monthly expenditure if he earns sh. 72000



a) Find the value of x

$$x + 90^\circ + 150^\circ = 360^\circ$$

$$X + 240^\circ = 360^\circ$$

$$X + 240^\circ - 240^\circ = 360^\circ - 240^\circ$$

$$X = 120^\circ$$

b) How much does he spend on transport?

$$\frac{90^\circ}{360^\circ} \times 72000$$

$$90 \times 200$$

Sh. 18000

$$\text{or } 360^\circ \dots\dots\dots 72000$$

$$1^\circ \text{ rep} \dots\dots\dots \frac{72000}{360^\circ}$$

sh 200

$$90^\circ \dots\dots\dots 90 \times \text{sh. } 200$$

Sh. 18000

c) How much is spent on fees than food?

$$150^\circ - 120^\circ = 30^\circ$$

$$= \frac{30^\circ}{360^\circ} \times \text{sh } 7200$$

$$= 30 \times \text{sh } 200$$

$$= \text{sh } 6000$$

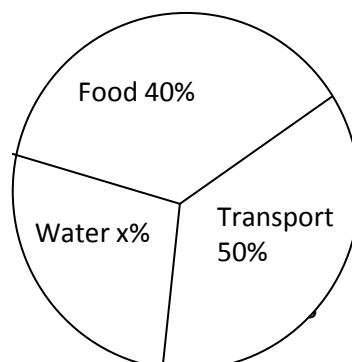
MK Primary MTC Bk 6 Pg

Understanding MTC bk6 pg 137

Functional primary MTC Bk 6 pg 134

PIE CHART INVOLVING PERCENTAGE.

1.The pie chart below shows how John spends sh 12000 in a day



a) Find the value of x

$$x + 40\% + 50\% = 100\%$$

$$x + 90\% = 100\%$$

$$x + 90\% - 90\% = 100\% - 90\%$$

$$x = 10\%$$

b) Find how much spent food is:

Food; 40% of 1200

$$\frac{40}{100} \times 1200$$

$$= \text{sh. } 480.$$

c) Find the angle sector

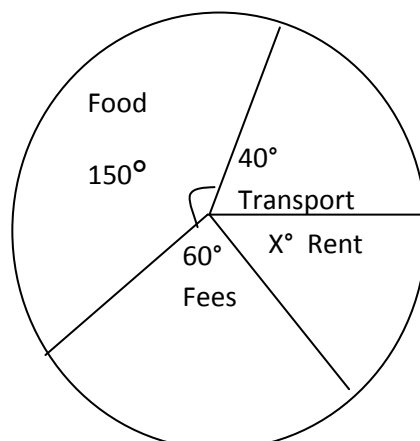
transport.

$$50\% = \frac{50}{100} \times 360^\circ$$

$$= 180^\circ$$

APPLICATION OF PIE CHART. (week 10 lesson 1 and 2)

1. The pie chart below shows how a family spends its income .



a) Find the value of x

$$X + 60^\circ + 40^\circ + 150^\circ = 360^\circ$$

$$X + 100^\circ + 150^\circ = 360^\circ$$

$$X + 250^\circ = 360^\circ$$

$$X + 250^\circ - 250^\circ = 360^\circ - 250^\circ$$

$$X = 110^\circ$$

b) If the family spends 24000 on fees, find the family's total income

Method 1

Let the total of income be y

$$\frac{60}{360} \times y = 24000$$

$$36 \times \frac{6y}{36} = 24000 \times$$

36

$$\frac{6y}{6} = \frac{24000 \times 36}{6}$$

$$Y = 24000 \times 6$$

$$Y = \text{sh } 144000$$

Method 2

Angle sector for fees = 60°

60° rep sh 24000

1° rep $\frac{\text{sh } 24000}{60}$

360° rep $\frac{\text{sh } 24000}{60} \times 360$

24000×6

Sh. 144000

CONSTRUCTION OF PIE CHART (week 10 lesson 3 and 4)

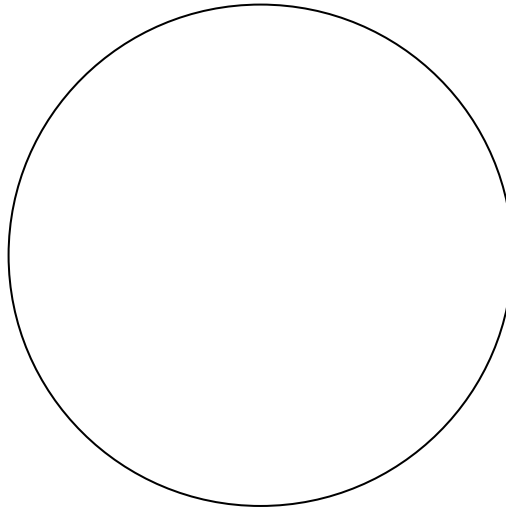
1. On a farm $\frac{2}{3}$ of the animals are cows, $\frac{1}{4}$ are goats and $\frac{1}{12}$ of them are sheep.

Construct a pie chart to show the above information

$$\begin{aligned}\text{Cows } \frac{2}{3} \times 360^\circ \\ = 240^\circ\end{aligned}$$

$$\begin{aligned}\text{goats } \frac{1}{4} \times 360^\circ \\ = 90^\circ\end{aligned}$$

$$\begin{aligned}\text{sheep } \frac{1}{12} \times 360^\circ \\ = 30^\circ\end{aligned}$$



2. The table below shows the number of books in the school library.

Subject	Math	English	Science	SST
No of books	50	35	20	15

Represent the above information on the pie chart

$$\begin{aligned}\text{Total no. of books } 50 + 35 + 20 + 15 \\ = 120\end{aligned}$$

Maths
SST

English

science

$$\frac{50}{120} \times 360^\circ$$

$$= 150^\circ$$

$$\frac{35}{120} \times 360^\circ$$

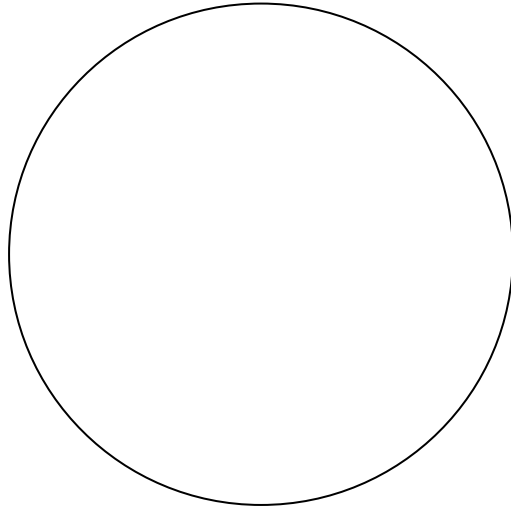
$$= 105^\circ$$

$$\frac{20}{120} \times 360^\circ$$

$$= 60^\circ$$

$$\frac{15}{120} \times 360^\circ$$

$$= 45^\circ$$



2. The table below represents how Mr. Mirundi spends his salary.

Items	Car expense	Food	School fesss	Others	Savings
Percentages	15%	20% x		10%	15%

a) Find the value of x

$$X + 15\% + 20\% + 10\% + 15\% = 100\%$$

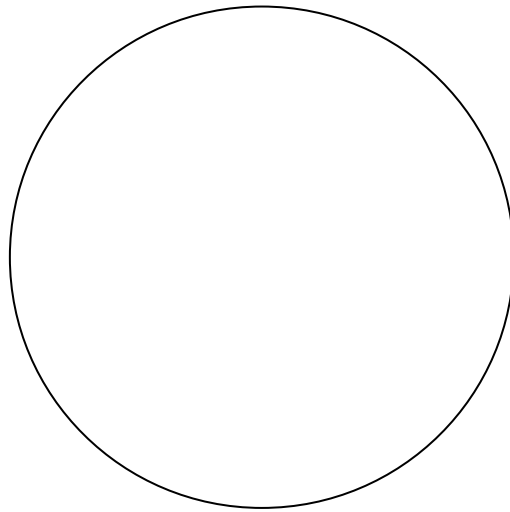
$$X + 60\% = 100\%$$

$$X + 60\% - 60\% = 100\% - 60\%$$

$$X = 40\%$$

b) Draw a pie chart to represent the information above.

Car expense	food	school fees	others	savings
$= \frac{15}{100} \times 360^\circ$	$= \frac{20}{100} \times 360^\circ$	$= \frac{40}{100} \times 360^\circ$	$= \frac{10}{100} \times 360^\circ$	$= \frac{15}{120} \times 360^\circ$
$= 54^\circ$	$= 72^\circ$	$= 144^\circ$	$= 36^\circ$	$= 54^\circ$



CO-ORDINATES (week 10 lesson 5,6 and 1 week 11)

Co-ordinates are ordered pairs of numbers used to mark or plot a point on a grid.

Co-ordinates are in order of? (x, y)

Examples of coordinators (2,4) (-2,5) (0,6) (-4,0)

A co-ordinate graph has two axes i.e. y axis and x axis

y axis runs from north to south (vertical axis)

x axis runs from west to east (horizontal axis)

A Co-ordinate graph has very many lines.

N.B All lines that are parallel to y axis and cross the x axis are called x lines.

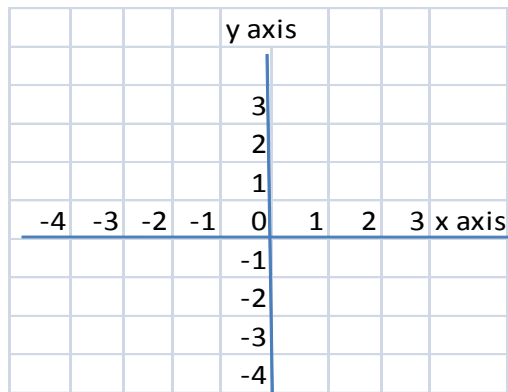
All lines that are parallel to x axis and cross the y axis are called y lines

x and y lines are named according to the point through which they pass or cross the x or y axis.

Example

A line crossing the x axis at point 2 is called $x=2$

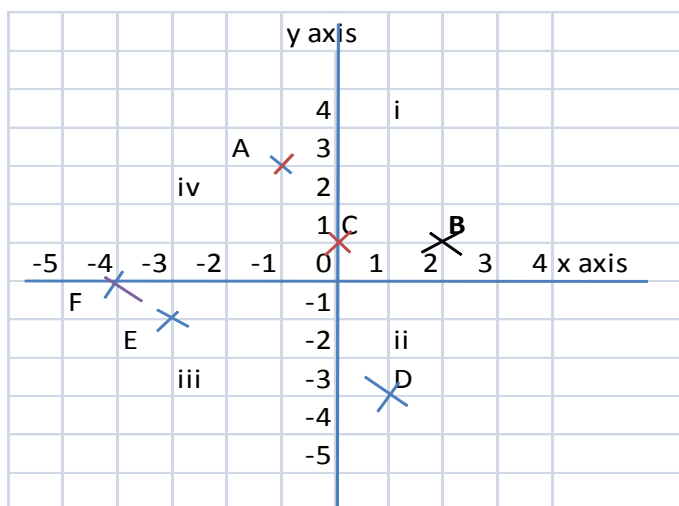
A line crossing the y axis at point 2 is called $y=2$



NAMING THE GIVEN POINT

(Giving the coordinate of the given point)

Coordinates are written in the order (x, y) when the x line and the y line meet they form a point. We can name the points formed by using the two lines that have crossed each other starting with the x line and then the y line.



Region I all coordinates are positive (+x, +y)

Ii all x coordinates are positive and y negative (+x, -y)

Iii all coordinates are negative (-x, -y)

Iv all x coordinates are negative and y coordinates are positive (-x, +y)

Name the given coordinates of point

A (-1,3) E(-3,-1)

B (2,1) F(-4,0)

C (0,1)

D (1,-3)

MK Primary MTC book 7 page 177

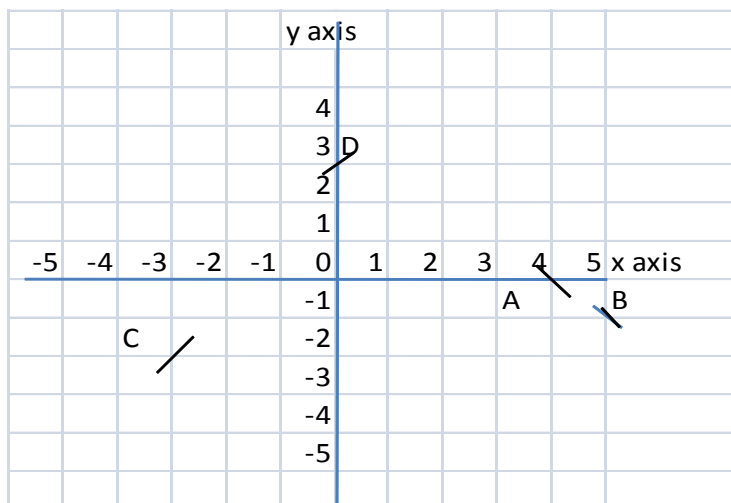
Functional primary MTC book 7 page 163

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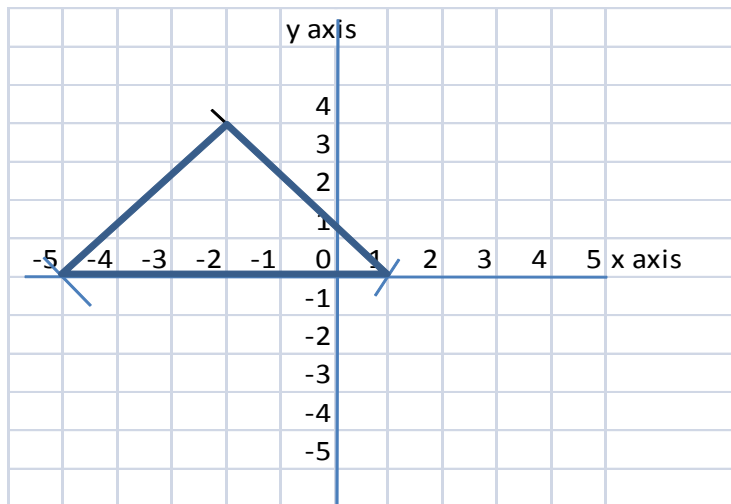
PLOTTING POINTS ON A GRID

Plot the following points on the grid A(4,0) B(5,-1) C(-3,-2) D(0,3)



FORMATION OF FIGURES BY PLOTTING

Plot P(-2,4), Q (1,1), R(-5,1) join P to Q, Q to R, and R to P name the figure formed.



Triangle

$$\text{Area} = \frac{1}{2}bh$$

$$= \frac{1}{2} \times 6\text{units} \times 3\text{units}$$

$$= 9 \text{ sq units}$$

MONEY (week 11 lesson 2)

Money is a measure of value and a medium of exchange for goods and services.

There are coins and notes (paper money).The notes have serial numbers.

FINDING THE NUMBER OF BANK NOTES

Examples

1. A trader went to New Creation bank and withdrew five thousand shilling bank notes numbered from AP234500 to AP234599.

a) How many bank notes did he withdraw from the bank?

No. of bank notes=(Last note – First note) + 1

$$= \text{AP234599}$$

$$-\text{AP234500}$$

$$99 + 1$$

No. of bank notes= 100 notes

b) How much money did he withdraw altogether?

1 note ----- 5000/=

100 notes----- 5000/= x 100

500000/=

He withdrew 500000/=

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CURRENCY CONVERSION (week 11 lesson 3)

A currency is the money used in a particular country. Different countries use different currencies as shown by the table below.

COUNTRY	CURRENCY	SYMBOL
Uganda	Shilling	Ush
Kenya	Shilling	Ksh
Tanzania	Shilling	Tzsh
France	Franc	Ff
Zambia	Kwacha	Zk
Rwanda	Franc	Rf
Australia	Dollar	\$
India	Rupee	Rs
Italy	Lira	Lit
Denmark	Kronme	(Nkr)
Libya	Binar	(Id)
COUNTRY	CURRENCY	SYMBOL
Spain	Peseta	(pta)

Greece	Drachima	(Dr)
Japan	Yen	Y
China	Yuan	
Nigeria	Naira	(n)
S. Africa	Rand	S.A Rand
Sudan	Pound	\$sd
U.S.A	US dollar	\$

Currency conversion

Example

1. Wandera has 20 US dollars. How much money in Ugandan shillings does he have if 1 US dollar is equivalent to Ush.2600?

1 US dollar-----Ush.2600

20 US dollars-----Ush.2600 x20

Ush.52000

Wandera had Ush.52000

2. Anthony has Ush.960000, How many British Pounds will he get if Ush.3200 is equivalent to 1 British Pound?

Ush.3200-----1 pound

Ush.960000----- 960000

3200

Anthony will get 300 British Pounds.

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TIME SPAN DURATION (week 11 lesson 4 and 5)

How many hours are there between 2:30am and 9:00 am?

$$\begin{array}{r} \text{Duration} \quad 9:00\text{am} \\ - \quad 2:30\text{am} \\ \hline 6:30 = 6 \text{ hours } 30 \text{ minutes} \end{array}$$

$$6\frac{1}{2} \text{ Hrs}$$

The lesson started at 9:40am and ended at 1:20pm. How long did it take?

Duration = Ending time – Starting time

$$\text{Ending time} = 1:20\text{pm} = 1320\text{Hrs}$$

$$\text{Starting time} = 9:40\text{am} = 0940\text{Hrs}$$

$$= \quad 1320\text{Hrs} \quad 60 + 20 = 80$$

$$\quad - 0940\text{Hrs} \quad \quad - 40$$

$$\quad \quad 340 \quad \quad 40$$

$$3 \text{ Hours } 40 \text{ minutes}$$

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MORE ABOUT TIME

A forty minutes lesson started at 9:40am when did it end.?

Ending time = Starting time + Time taken

$$9:40\text{am} \quad 40+40 = 80$$

$$\quad + 40 \quad \quad -60$$

$$1020 \quad \quad 20$$

It ended at 10:20am

An examination took 2 hours and 15 minutes. If the examination ended at 1:30pm when did it start?

Starting time = Ending time – Duration

1:30pm – 2Hrs Min

1:30pm – 1330Hrs

Hrs Min

13 30

- 2 15

11 15

It started at 11:15am.

TIME TABLES

The timetable shows the departure and arrival time of a taxi at the given stations.

STATION	ARRIVAL	DEPARTURE
Kayabwe		8:15am
Buwama	8:35am	8:45am
Kamengo	9:10am	9:17am
Mpigi	9:47am	10:02am
Katende	10:15am	10:25am
Nsangi	10:40am	11:00am
Kyengera	11:30am	11:40am
Kampala	11:55am	

NB: Time spent at a station = Departure – arrival

Time taken to travel from one station to another

= Arrival time at last station – Departure time at 1st station

At what time did the taxi arrive at Nsangi?

At 10:40am

At what time did the taxi leave Katende?

At 10:25am.

SPEED

$$\text{Speed / average speed} = \frac{\text{Dis tance covered}}{\text{Time taken}}$$

A car travels for 3 hours to cover a distance of 210KM. at what speed does the car travel?

$$\begin{aligned}\text{Speed} &= \frac{\text{Dis tance}}{\text{Time}} \\ &= \frac{210\text{km}}{3\text{Hrs}} \\ &= \underline{\underline{70 \text{ km / hr}}}\end{aligned}$$

A train travelled for 40 minutes and covered 280km. what was its average speed?

$$\begin{aligned}\text{Average speed} &= \frac{\text{Dis tance covered}}{\text{Time taken}} \\ 280 \text{ km} \div \frac{40}{60} \text{ hrs} \\ 280\text{km} \times \frac{60}{40} \text{ hrs} \\ 70 \text{ km} \times 6 \\ &= \underline{\underline{420\text{km / hr}}}\end{aligned}$$

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DISTANCE SPEED AND TIME revision(week 11 lesson6)

Distance = Speed x Time

Find the distance travelled by a car in 3 hours at 60km / hr.

$$S = 60\text{km/hr} \quad T = 3\text{hrs}$$

$$D = S \times T$$

$$60\text{km} / \text{hr} \times 3\text{hrs}$$

$$\frac{60\text{km}}{1\text{hr}} \times 3\text{hrs}$$

$$= \underline{\underline{180\text{km}}}$$

A bus travelled at 120km / hr for 45 minutes.

Find the distance covered.

$$D = S \times T$$

$$120\text{km} / \text{hr} \times \frac{45}{60}\text{hrs}$$

$$\frac{120\text{km}}{1\text{hr}} \times \frac{45}{60}\text{hrs}$$

$$2\text{km} \times 45$$

$$\underline{\underline{90\text{km}}}$$

A bus travelled at 50km / hr leaves Wanseko at 7:30am and arrives at Kampala at 1:30pm.

What is the distance between Kampala and Wanseko?

$$D = S \times T$$

$$D = 50\text{km} / \text{hr} \times 6\text{hrs}$$

$$T = 1:30\text{pm} - 7:30\text{am} \quad \frac{50}{1\text{km}} \times 6\text{hrs}$$

$$1330\text{hrs}$$

$$\underline{\underline{300\text{km}}}$$

$$\underline{\underline{- 730\text{hrs}}}$$

$$6\text{hrs}$$

FINDING TIME TAKEN

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

How long will a car take to cover a distance of 120km at a speed of 40km /hr

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

$$\frac{120\text{km}}{40\text{km/hr}}$$

$$\underline{3\text{hours}}$$

A car covered a distance of 120km at an average speed of 60km/hr. how much longer does it take if it moves at 40km/hr.

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

$$\frac{120\text{km}}{60\text{km/hr}}$$

$$2\text{hrs}$$

Time taken when using a speed of 40km/h

$$\frac{120\text{km}}{40\text{km/hr}}$$

$$3\text{hrs}$$

$$3\text{hrs} - 2\text{hrs} = \underline{1 \text{ hours longer.}}$$

At 30km/hr a car covers a distance of 180km. How many hours does it take to cover the same distance at 90km/hr.

MORE ABOUT SPEED (week 12 lesson1)

EXPRESSING KILOMETRES PER HOUR AS METRES PER SECOND

Express 72km/hr as metres per second.

$$\text{Km} = 1000\text{m}$$

$$72\text{km} = 72 \times 1000\text{m}$$

$$\underline{72000\text{m}}$$

$$1\text{hr} = 3600 \text{ sec}$$

$$\text{Speed} = \frac{72000m}{3600\text{sec}} = \underline{\underline{20m/sec}}$$

Express 360km/hr as metres per second

$$1\text{km} = 1000\text{m}$$

$$360\text{km} = 360 \times 1000\text{m}$$

$$360000\text{m}$$

$$1\text{hr} = 3600\text{sec}$$

$$\frac{360000m}{3600\text{sec}}$$

$$\underline{\underline{100m/sec}}$$

Week 12 lesson 2

EXPRESSING METRES PER SECOND TO KILOMETRES PER HOUR

Express 20m/sec to km/hr

$$1000\text{m} = 1\text{km}$$

$$20\text{m} = \frac{20}{1000}km$$

$$3600\text{sec} = 1\text{hr}$$

$$1\text{sec} = \frac{1}{3600}hr$$

$$S = \frac{20}{1000}km \div \frac{1}{3600}hr$$

$$\frac{20}{1000}km \times \frac{3600}{1}hr$$

$$= \underline{\underline{72km/hr}}$$

Change 100m/sec to km/hr

$$1000\text{m} = 1\text{km}$$

$$100\text{m} = \frac{100}{1000}\text{km}$$

$$3600\text{sec} = 1\text{hr}$$

$$1\text{sec} = \frac{1}{3600}\text{hrs}$$

$$S = \frac{100}{1000}\text{km} \div \frac{1}{3600}\text{hrs}$$

$$\frac{100}{1000}\text{km} \times \frac{1}{3600}\text{hr}$$

$$\underline{\underline{360\text{km} / \text{hr}}}$$

FINDING AVERAGE SPEED (week 12 lesson 3 and 4)

A car takes 3 hours to cover a certain journey at 60km/hr but it takes only 2 hours to return through the same distance. Calculate the average speed for the whole journey.

1st part of the journey

2nd journey

$$T = 3\text{hrs}$$

$$\text{Distance} = 180\text{km}$$

$$S = 60\text{km/hr}$$

$$T = 2\text{hours}$$

$$D = S \times T$$

$$60\text{km/hr} \times 3\text{hrs}$$

$$\frac{60\text{km}}{1\text{hr}} \times 3\text{hr}$$

$$\underline{\underline{180\text{km}}}$$

$$\text{Average speed} = \frac{T \cdot \text{Distance}}{\text{Total time}}$$

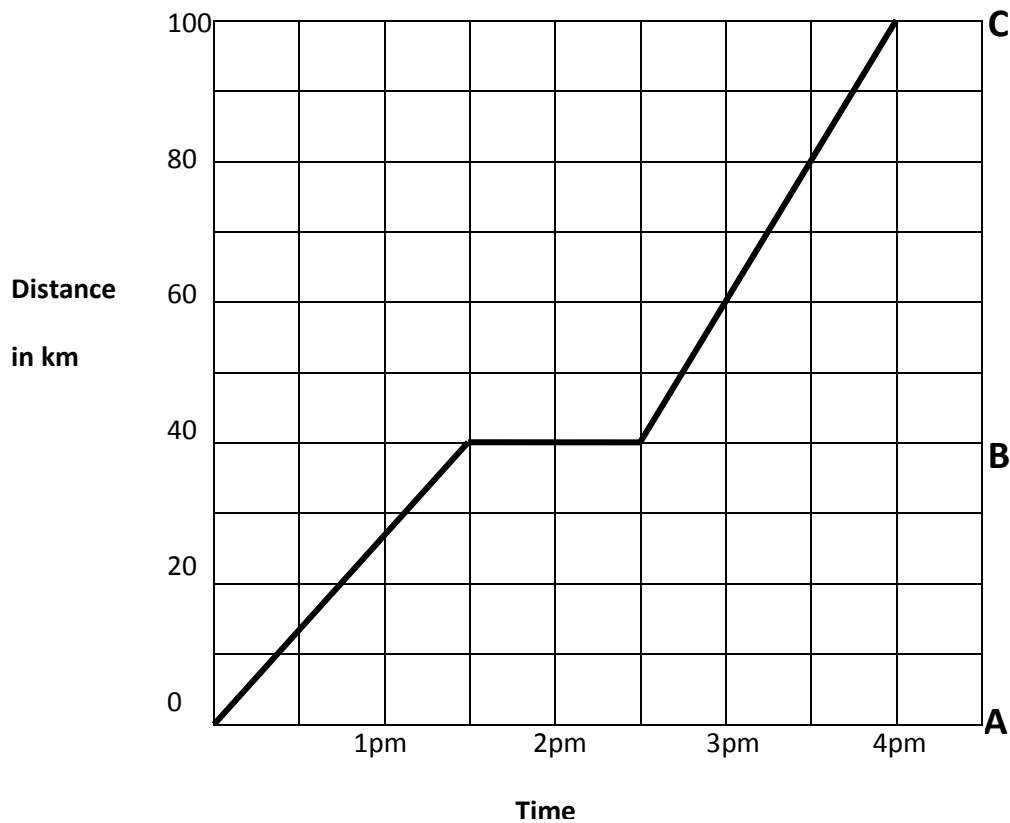
$$= \frac{180\text{km} + 180\text{km}}{3\text{hr} + 2\text{hr}}$$

$$= \frac{360\text{km}}{5\text{hrs}}$$

$$= \underline{\underline{72\text{km/hr}}}$$

TRAVEL GRAPHS (week 12 lesson 5 and 6).

The total graph below shows the motorists journey from town A via town B to town C.



- a) Find the scale on the vertical axis.

$$2\text{sq} \rightarrow 20\text{km}$$

$$1\text{sq rep } \frac{20\text{km}}{2}$$

$$1\text{sq rep } 10\text{km}.$$

- b) What was the horizontal axis represent?

Time

- c) How far if town A from B? 40km

- d) How far is town C from B?

$$100\text{km} - 40\text{km}$$

$$= 60\text{km}$$

- e) For how long was he at town b?

for 1 hour.

- f) At what time did he leave town B?

2:30pm

- g) Calculate the average speed of the motorists.

Distance = 100km

Time = 4hrs

$$\text{Speed} = \frac{100\text{km}}{4\text{hrs}}$$

$$= 25 \text{ km/hr}$$

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