THEME: INTERPRETATION OF GRAPHS AND DATA.

TOPIC: DATA HANDLING.

Content: Collecting and presenting data in table form.

Example

Given the numbers 8, 2, 6, 4, 2, 1 and 2, represent the numbers on a table.

Number	tallies	Frequency
8	I	1
2	III	3
6	I	1
4	I	1
1	I	1

Evaluation activity

Represent the following numbers on a table;

a) 7, 8, 0, 7, 4, 2, 7, 5, 7 and 6
b) 6, 9, 6, 5, 2, 9, 1, 3, 9 and 6
c) 4, 7, 3, 2, 0, 4, 8, 2, 5 and 4
d) 8, 10, 15, 11, 8, 15, 11, and 15
e) 30, 50, 40, 20, 70, 40, 50 and 40
f) 45%, 50%, 60%, 45%, 50%, 80% and 50%
g) 90%, 60%, 70%, 85%, 90%, 50% and 40%
h) -2, 5, -6, -3, 5, -2, -8, -5 and -3
i) 9, -4, 0, -7, 8, -3, 3, 9, -1 and 7

Lesson 2

Finding range of ungrouped data and range of integers

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

Example.1. Given the following 2, 4, 6,7,8,3. Find the range.

Range = H – L

Range = 8 – 2

Range = 6

Example 2.Given the following -3, -5, -1, -9, -2 and -10. Find the range.

Range = H – L

Range = -1- (-10)

Range = -1 + 10

Range = 9

Evaluation activity

Find the range of the following numbers;

a) 7, 9, 8, 0, 5, 2 and 1 b) 8, 5, 7, 2, 3, 9, and 5
C) 30%, 90% 25% and 65% d) 6, 3, 8, 4, 9 and 7
e) -4, 9, -3, 8, -2, 0 and 4 f) -1, 3, -7, -3, -5 and 5
g) -5, 9, 0, 3, 5, -4 and 8 h) 60, 10, 80, 20 and 65
i) 70%, 90%, 30%, 65%, 95%, 20%, 40% and 25%

Lesson 3

Solving problems involving range

Example 1.The range of two numbers is 15, the smallest number is 9. Find the biggest number.

Highest – Lowest = Range

h – 9 = 15

h – 9 + 9 = 15 + 9

h = 24

Example 2.The range of two numbers is 5, the smallest number is -3. Find the biggest number.

Highest – Lowest = Range

h – (-3) = 5

h + 3 = 5

h + 3 – 3 = 5 – 3

h = 2

Evaluation activity

1. The range of two numbers is 12, the smallest number is 5. Find the biggest number.
2. The range of two numbers is 6, the smallest number is -2. Find the biggest number.

3. The range of two numbers is 7, the smallest number is -5. Find the biggest number.
4. The range of two numbers is 22, the biggest number is 15. Find the smallest number.
5. The range of two numbers is -2, the biggest number is -5. Find the smallest number.
6. The range of two numbers is -8, the smallest number is -4. Find the biggest number.

Lesson 4

Finding mode and modal frequency

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

Or the number/ score with the highest frequency.

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

Example: Given the numbers 8, 2, 6, 4, 2, 1 and 2. Find;

a) Mode b) modal frequency

Number	tallies	Frequency
8	I	1
2	III	3
6	I	1
4	I	1
1	I	1

Mode = 2

Modal frequency = 3

Evaluation activity

Find the mode and the modal frequency of the following numbers;

a) 7, 9, 8, 0, 7, 2 and 1 b) 8, 5, 7, 2, 3, 9, and 5
C) 30%, 90% 25% and 30% d) 6, 3, 8, 4, 9 and 3
e) -4, 9, -3, 8, -2, 0 and -4 f) -1, 3, -7, -3 and 3
g) -5, 9, 0, 3, 5, -4 and 8 h) 60, 10, 80, 20 and 60
i) 25%, 90%, 30%, 65%, 25%, 20%, 40% and 25%

Lesson 5

Finding the median of ungrouped data and integers

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

Example: 1. Find the median of 4,2,6,7,8,9,3

=②③④,6,⑦⑧⑨

Median = 6

Example: 2. Find the median -3, -9, 7, 4, -1, -4, 5

= -9, -4, -3, -1, ④⑤⑦

Median = -1

Evaluation activity

Find the median of the following numbers;

a) 7, 9, 8, 0, 7, 2 and 1 b) 8, 5, 7, 2, 3, 9, and 5

C) 30%, 90% 25% and 30% d) 6, 3, 8, 4, 9 and 3

e) -4, 9, -3, 8, -2, 0 and -4 f) -1, 3, -7, -3 and 3

g) -5, 9, 0, 3, 5, -4 and 8 h) 60, 10, 80, 20 and 60

i) 25%, 90%, 30%, 65%, 25%, 20%, 40% and 25%

Lesson 6

Finding median of fractions

Example. Find the median of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$ and $\frac{1}{5}$

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

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

$(\frac{(4x1)+(3x1)}{3x4}) \times \frac{1}{2}$

$\frac{4+3}{12} \times \frac{1}{2} = \frac{7}{12} \times \frac{1}{2}$

$= \frac{7}{24}$

Evaluation activity

Find the median of the following fractions;

1. $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{12}, \frac{1}{5}$
2. $\frac{1}{2}, \frac{1}{5}, \frac{1}{3}, \frac{1}{6}, \frac{1}{7}$

3. $\frac{1}{2}, \frac{1}{6}, \frac{1}{8}, \frac{1}{3}$
4. $\frac{1}{2}, \frac{1}{3}, \frac{1}{5}, \frac{1}{10}$
5. $\frac{1}{2}, \frac{1}{9}, \frac{1}{3}, \frac{1}{4}$

Lesson 7

Solving problems involving median

Example: 1.The median of five consecutive counting numbers is 7. Find the numbers.

The numbers are; n, n+1, n+2, n+3 and n+4

The median = n+2,

n + 2 = 5

n + 2 – 2 = 5 – 2

n = 3

The numbers are; 3, 4, 5, 6 and 7

Example: 2.The median of five consecutive odd numbers is 9. Find the numbers.

The numbers are; n, n+2, n+4, n+6 and n+8

The median = n+4,

n + 4 = 9

n + 4 – 4 = 9 – 4

n = 5

The numbers are; 5, 7, 9, 11 and 13

Evaluation activity

1. The median of five consecutive counting numbers is 15. Find the numbers
2. The median of seven consecutive counting numbers is 19. Find the numbers
3. The median of five consecutive odd numbers is 11. Find the numbers.
4. The median of seven consecutive odd numbers is 17. Find the numbers.
5. The median of five consecutive even numbers is 14. Find the numbers.
6. The median of seven consecutive even numbers is 28. Find the numbers.
7. The median of five consecutive even numbers is 52. Find the numbers.
8. The median of nine consecutive even numbers is 92. Find the numbers.

Lesson 8

Calculating mean of ungrouped data and integers.

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.

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

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

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

$$= \frac{2+4+7+2+8+1}{6}$$

$$= \frac{24}{6}$$

$$= 4$$

Example 2. Find the mean of -3, -2, 9, -5, 7 and 6

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

$$= \frac{-3+-2+9+-5+7+6}{6}$$

$$= \frac{22-10}{6} = \frac{12}{6}$$

$$= 2$$

Evaluation activity

1. Find the mean of 3, 5, 7, 2 and 4
2. Find the mean of 7, 9, 2, 4, 5, 0 and 3
3. Workout the mean of 30%, 50%, 70%,40% and 30%
4. Find the mean of 30%, 50%, 80%, 30%, 10%and 40%
5. Workout the mean of -4, -6, -1, -6, 4 and -4
6. Find the mean of -3, -5, -1, 0, 8, 9 and 4

7. Workout the mean of -3, 6, -1,0, 7, -3 and 1
8. Workout the mean of 9, 0, 2, 6, 1, 7, 8, and 7
9. Find the mean 0f 9, 0,1, -4, 9, -5, 8 and -3
10. Find the mean of 3, 5, 7, 2, 3, 0 and 3

Lesson 9

Calculating mean of algebraic expressions

Example 1. Find the mean of 6, 4, 2a, 3a, and 5

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

$$= \frac{6+4+2a+3a+5}{5}$$

$$= \frac{6+4+5+2a+3a}{5}$$

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

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

$= 3 + a$ or $a + 3$

Example 2. Find the average of 4x +1, 5x and 14

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

$$= \frac{(4x+1) + 5x + 14}{3}$$

$$= \frac{4x+ 5x+ 1+ 14}{3}$$

$$= \frac{9x + 15}{3}$$

$$= \frac{9x}{3} + \frac{15}{3}$$

$$= 3x + 5$$

Evaluation activity

1. Find the average of 3k +2, 7k and 13
2. Find the average of 8y +1 6y,2y and 14
3. Find the average of 4m +1, 5m and 14
4. Find the average of 3p +2, 2p + 3 and 10
5. Find the average of 2r, 7r, 0, r, 5 and 15

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Lesson 10

PROBLEMS ON AVERAGE.

Examples

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 = sum of items.

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

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

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

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

$$10 + x = 16$$

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

$$X = 6$$

Evaluation activity

1. 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?

2. The average height of 4 people is 3m. When the height of the 5^{th} is added, their average height becomes 4m.Find the height of the fifth person.

3. The average weight of 3 pupils is 12kg. When one pupil joins the group, the average becomes 15kg.Find the total weight of all the pupils.

4. The average age of 5 children is 25years. When 2 children leaves the group, the average becomes 15years. Find the total age of the remaining pupils.

5. The average weight of four pupils 7kg and the average weight of six other pupils is 12kg. Find the average weight of all the pupils.

6. The average weight of 9 pupils 15kg and the average weight of six other pupils is 13kg. Find the average weight of all the pupils.

Lesson 11

Finding mean, median, mode, modal frequency and range.

Example: 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

Range = H – L

= 18 – 9

= 9

d) Find the mean

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

= $\frac{(9\times2)+(11\times1)+(12\times4)+(13\times1)+(18\times1)}{2+1+4+1+1}$

= $\frac{18+11+48+13+18}{9}$

= $\frac{108}{9}$

= 12

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

Median = 12

Evaluation activity

1. The table below shows the marks scored by P.6 pupils in a test. Use it to answer the questions about it.

Marks	60	90	80	70	70
Number of pupils	2	2	3	1	2

Find;

a) The number of pupils who did the test
b) The mode
c) The modal frequency
d) The median
e) The mean

2. The table below shows the marks scored by P.6 pupils in a test. Use it to answer the questions about it.

Marks	70	50	90	40	80
Number of pupils	2	1	1	2	4

Find;

a) The number of pupils who did the test
b) The mode
c) The modal frequency
d) The median
e) The mean

3. The table below shows the marks scored by P.6 pupils in a test. Use it to answer the questions about it.

Marks	90	80	80	40	50
Number of pupils	1	2	1	4	2

Find;

a) The number of pupils who did the test
b) The mode
c) The modal frequency
d) The median
e) The mean

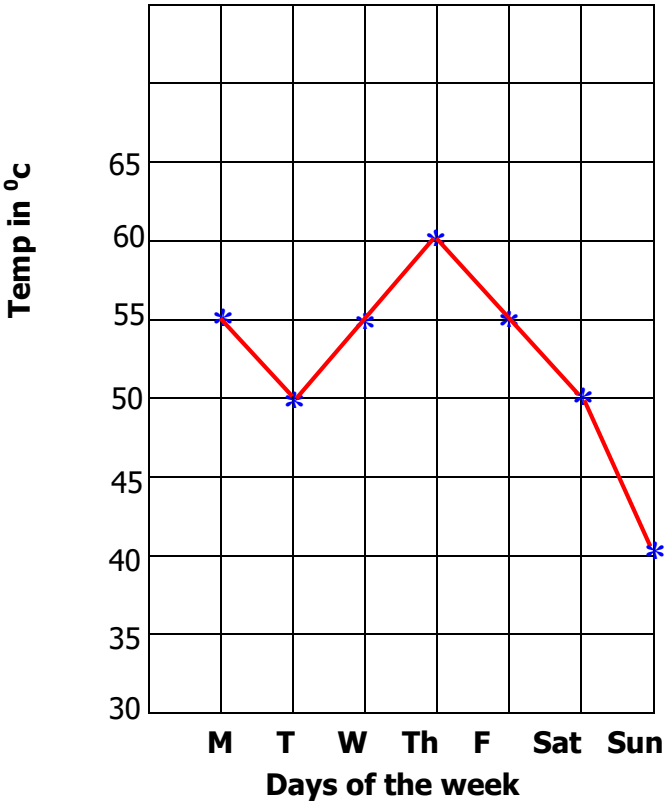
Lesson 12

Presenting and interpreting data using line graphs

A line graph is where the information plotted on a graph is marked and the required point is indicated with a star, thereafter joined by a thick line.

Line graphs display information or data that change continuously over time.

Example The graph below shows the midnight temperatures for the days of the last week.



QUESTIONS

i) Which day had the lowest midnight temperature?

= Sunday

ii) Give three days which had the same midnight temperatures.

= Monday, Wednesday and Friday

iii) What was the midnight temperature of Thursday?

= 60^0c

iv) Which day had the highest midnight temperature?

= Thursday

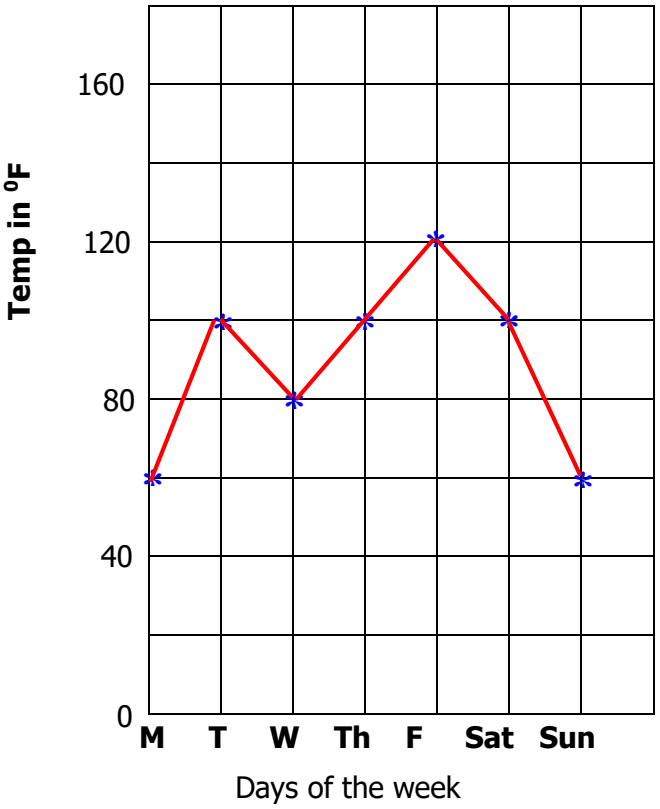
v) Find the range of the temperatures.

Range = H- L

Range = 60^0c – 40^0c Range = 20^0c

Evaluation activity

1. The graph below shows the temperatures for the days of the last week.



QUESTIONS

i) Which day had the lowest temperature?

ii) Give three days which had the same temperatures.

iii) What was the temperature of Thursday?

iv) Which day had the highest temperature?

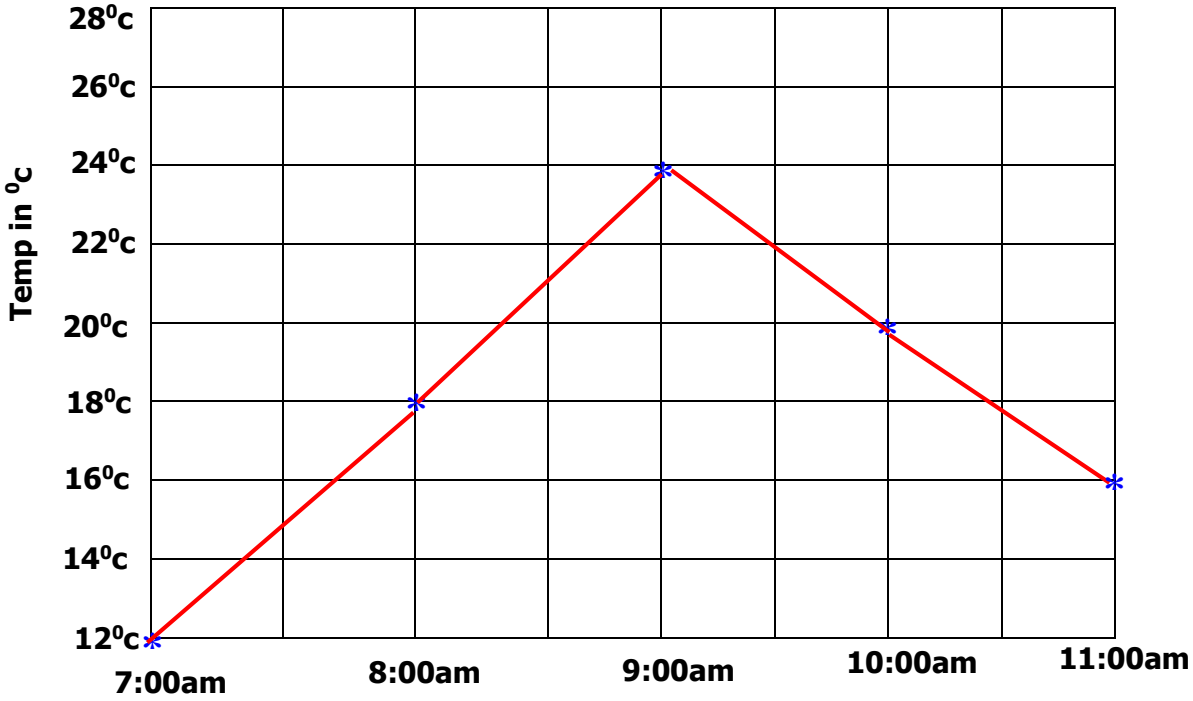
v) Find the range of the temperatures.

vi) Find the median temperature.

vii) Workout the mean of temperature.

viii) Find the mode

2. Use the graph below to answer the questions about it.



Questions

a) Which day had the lowest temperature?

b) What was the temperature at 10:00am?

c) Which day had the highest temperature?

d) Find the range of the temperatures.

e) Find the median temperature.

f) Workout the mean of temperature.

g) Find the mode

Lesson 13: PIE- CHARTS

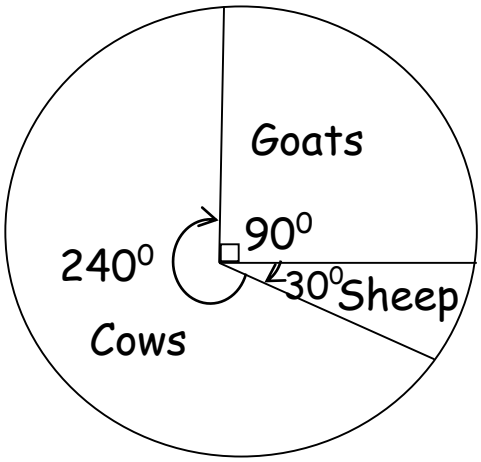
Drawing data on pie charts

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

It represents one complete whole in terms of fractions, 360^0 in terms of angles and 100% in terms of percentages.

Example: 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

Cows = $\frac{2}{3}$ × 360° = 2 x 120^0 = 240^0 Goats = $\frac{1}{4}$ ×360° = 90^0	Sheep = $\frac{1}{12}$ ×360° = 30^0



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

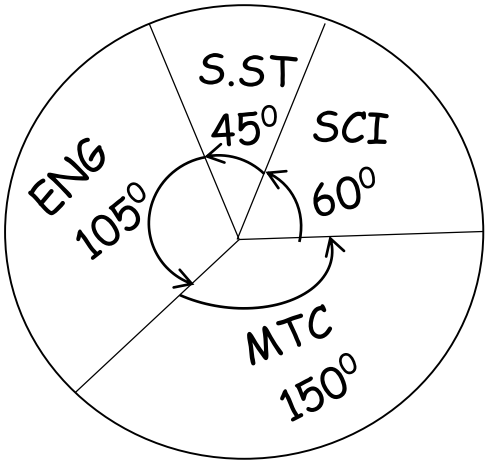
Subject	MTC	ENG	SCI	S.ST
No. of books	50	35	20	15

Represent the above information on the pie chart

Total no. of books 50 + 35 + 20 + 15

= 120

MTC = $\frac{50}{120}$ × 360° = 5 x 30^0 = 150^0	SCI = $\frac{20}{120}$ ×360° = 60^0
ENG = $\frac{35}{120}$ ×360° = 105^0	S.ST = $\frac{15}{120}$ × 360° = 45^0



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

Items	Car expense	School fees	Others	Saving
Percentages	15%	20%	x	15%

a) Find the value of x

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

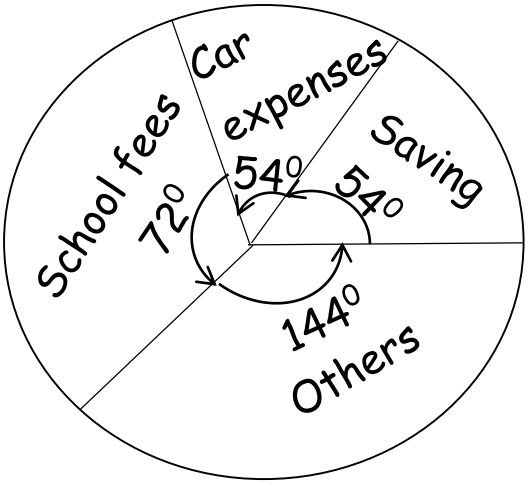
X +60% = 100%

X+ 60% - 60% = 100% - 60%

X = 40%

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

Car expense = $\frac{15}{100}$ × 360° = 3 x 18^0 = 54^0	others = $\frac{40}{100}$ ×360° = 144^0
School fees. = $\frac{20}{100}$ ×360° = 72^0	Saving = $\frac{15}{100}$ × 360° = 54^0



Evaluation activity

1. On a farm $\frac{1}{4}$ of the animals are sheep , $\frac{1}{8}$ are goats and $\frac{5}{8}$ of them are cows. Construct a pie chart to show the above information (use radius 4.5cm)

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

Subject	MTC	ENG	SCI	S.ST
No. of books	60	30	50	40

Represent the above information on the pie chart (use Radius 5cm)

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

Items	Rent	School fees	Others	Saving
Percentages	35%	10%	k	25%

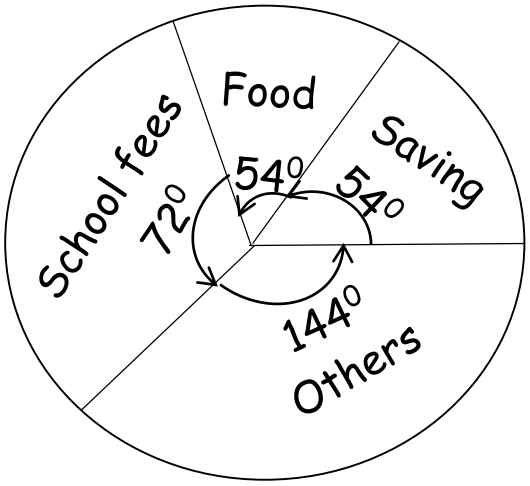
a). Find the value of k

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

Lesson 14

Interpreting data presented on pie charts

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



a) How much money is spent on each item?

School fees = $\frac{72}{360}$ × sh.24, 000 = 2 x sh. 2,400 = sh. 4,800	Food = $\frac{54}{360}$ × sh. 24, 000 = 6 x sh.600 = sh. 3,600
Saving. = $\frac{54}{360}$ × sh.24, 000 = 6 x sh. 600 = sh. 3,600	Others = $\frac{144}{300}$ x sh.24, 000 = 48 x sh.200 = sh. 9,600

b) Find the fraction for school fees.

$= \frac{72}{360}$

$= \frac{1}{5}$

c) What percentage of the total represents food?

$= \frac{54}{360} \times 100\%$

$= 15\%$

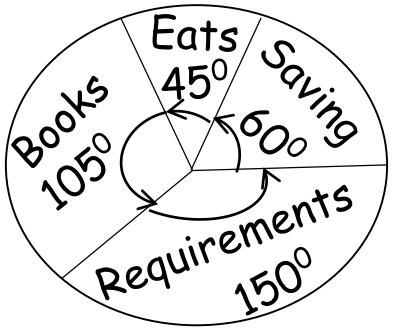
d) .How much more is spent on others than on saving?

= sh. 9,600 - sh. 3,600

= sh. 6,000 more

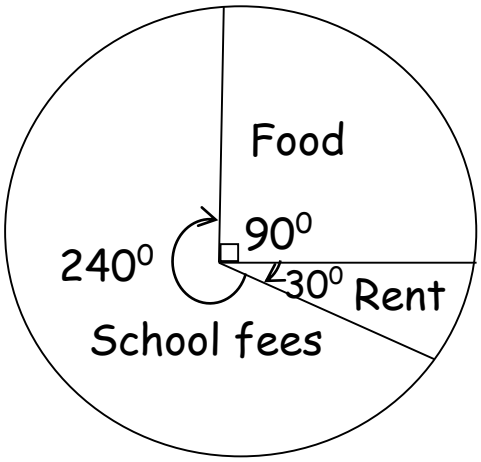
Evaluation activity

1. The pie- chart shows how a pupil spends his pocket money of sh. 36,000.



a) How much money does he spend on each item?
b) What fraction does he spend on eats?
c) What percentage represents saving?
d) How much more is spent on requirements than on books?

2. The pie- chart shows how a nurse spends her monthly of sh. 360,000

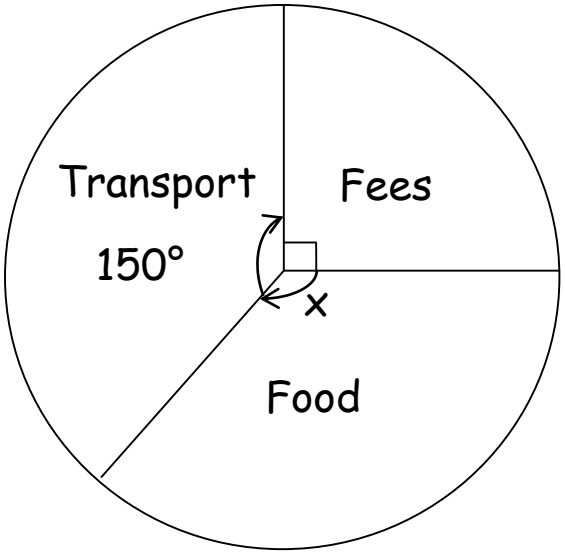


a) How much money does she spend on each item?
b) What fraction does she spend on rent?
c) What percentage represents food?
d) How much more is spent on school fees than on rent?

Lesson 15

Solving real life situations using pie charts

Example.1 The pie chart below shows Mugisha's monthly expenditure if he earns sh. 72000. Study it carefully and use it to answer the questions about it



a) Find the value of x

$x + 90° + 150° = 360°$

$x + 240° = 360°$

$x + 240° - 240° = 360° - 240°$

$x = 120°$

b) How much does he spend on transport?

$= \frac{90°}{360°} \times 72000$

$= 90 \times 200$

= Sh. 18000

or

360° 72000

1° rep..... $\frac{72000}{360°}$

sh 200

90° .....90 × sh. 200

Sh. 18000

c) How much is spent on fees than food?

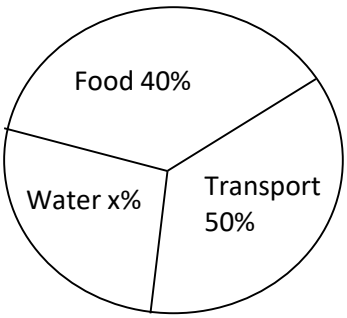
150° – 120° = 30°

$= \frac{30°}{360°}$ x sh 7200

= 30 x sh 200

= sh 6000

Example 2. 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

$\frac{40}{100}$ × 1200

= sh. 480.

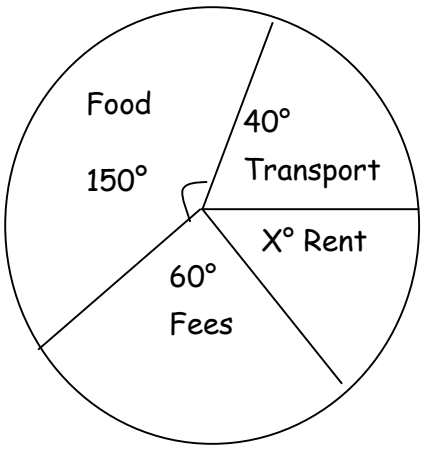
c) Find the angle sector transport.

50% = $\frac{50}{100}$ × 360°

= 180°

APPLICATION OF PIE CHART.

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



a) Find the value of x

$X + 60° + 40° + 150° = 360°$

$X + 100° + 150° = 360°$

$X + 250° = 360°$

$X + 250° - 250° = 360° - 250°$

$X = 110°$

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

Method 1

Let the total of income be y

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

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

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

$Y = 24000 \times 6$

$Y =$ sh 144000

Method 2

Angle sector for fees = 60°

60° rep sh 24000

1° rep $\frac{sh\ 24000}{60}$

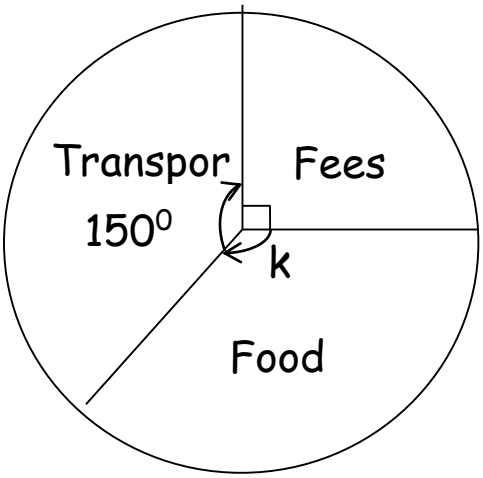
360° rep $\frac{sh24000}{60} \times 360$

$= 24000 \times 6$

= Sh. 144000

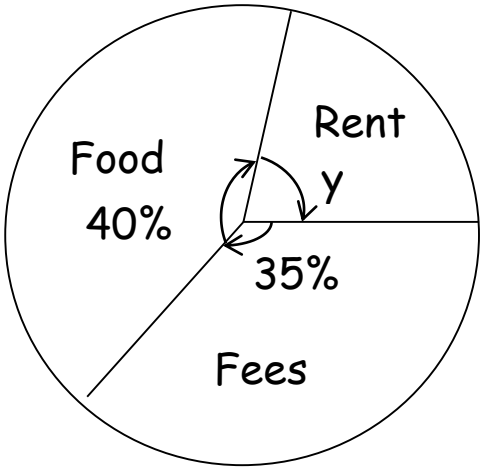
Evaluation activity

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



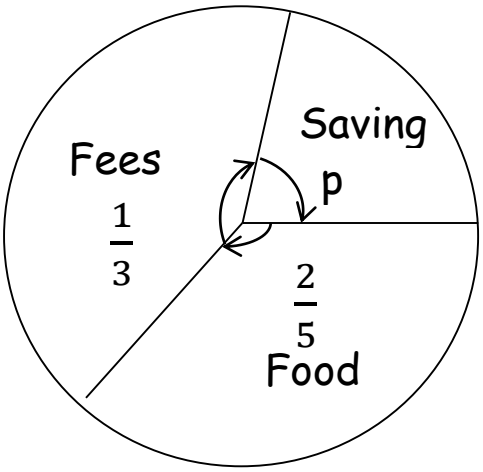
a) Find the value of k
b) If the family spends 24000 on fees, find the family's total income
c) Find the percentage for transport.

2. The pie chart below shows how Musa spends its income.



a) Find the value of y
b) If the family spends 240,000 on fees, find the family's total income
c) Find the fraction for fees.

3. The pie chart below shows how Doreen spends its income.



a) Find the fraction for P
b) If the family spends 180,000 on fees, find the family's total income
c) What percentage represents food?
d) How much more is spent on fees than on saving?

Lesson 16

Interpreting coordinate graphs

INTRODUCTION

Identifying lines of a coordinate graph

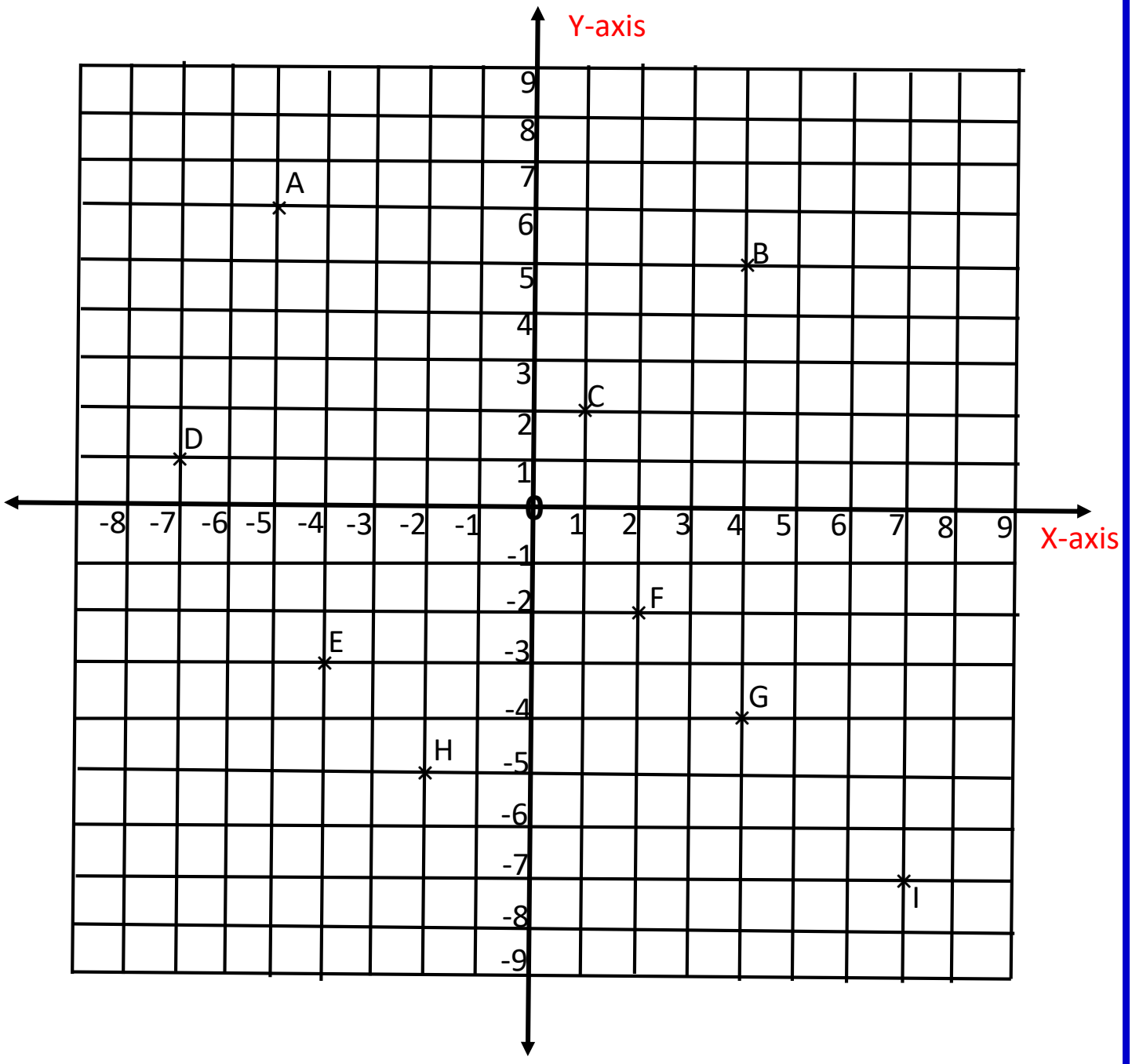
Note: -The horizontal axis is called x-axis and Vertical axis is called the y-axis

- We read from x-axis to y-axis
- Only ordinary brackets are used with no equal signs

Examples

Identify all possible lines on the grid below;

Write the coordinates of points A, B, C, D, E, F, G, H and I.



A (-5, 6), B (4, 5), C (1, 2), D (-7, 1)

Write the coordinates of the remaining points

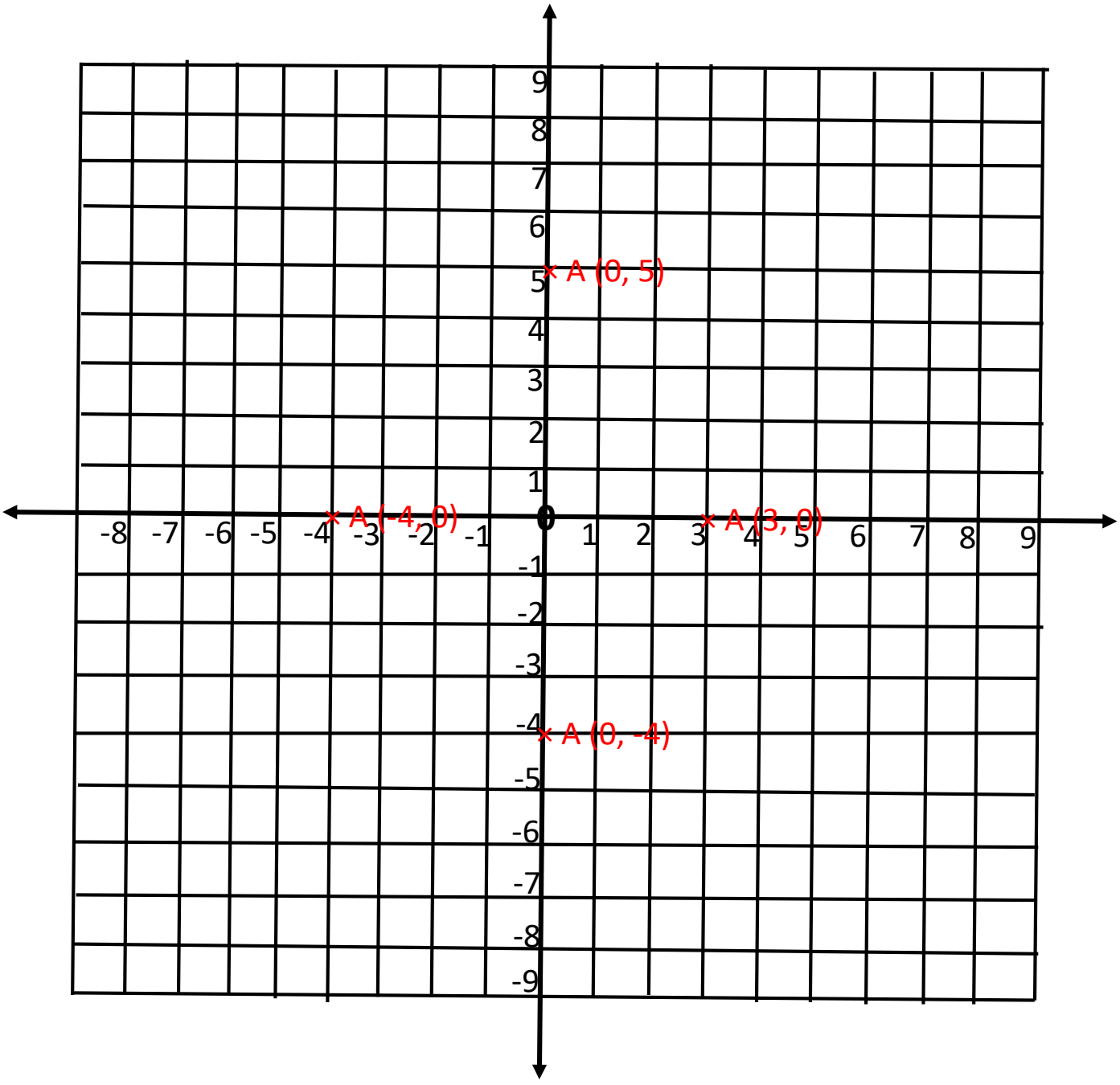
Lesson 17

Plotting coordinates on the grid ×

Plot the following point on a grid

A (0,5), B (0,-4) C(3,0), D (-4,0) E (-2,-2) F (-3,-5)

G (+2,-4), H (-5, +1), I (6, -4), J (5,-5), K (4,-2), L (-1,7)



Plot the remaining point on the coordinate graph.

REFERENCES

Fountain primary Maths Book 7 pages 177 to 198

MK Book 7 pages 164 to 188

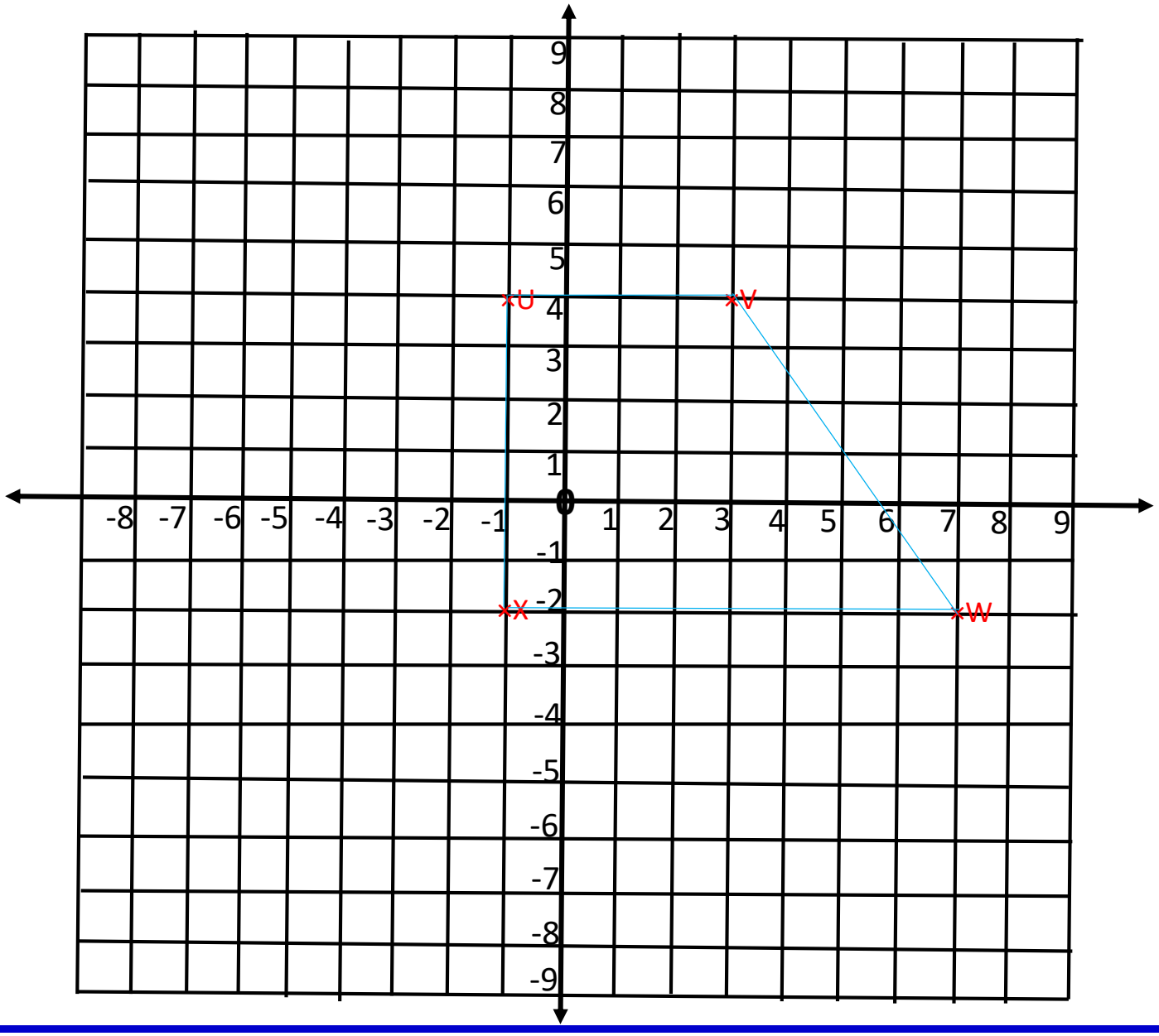
Understanding math Book 7 pages 153 to 189

Lesson 18

Forming figures on the grid and finding their area.

Example: On the grid below plot the following points

U (-1, 4), V (3, 4), W (7,-2) and X (-1,-2)



Join point U, to V, V to W, W to X and X to U and name the figure formed.

A trapezium

Find its area.

Area = $\frac{1}{2}$ h (a + b)

$\frac{1}{2}$ x 6units (4units + 8units)

3units x 12units

= 36square units

If each small square represents a cm, work out the area of the above figure

Area =$\frac{1}{2}$ h (a + b)

= 1 x6cm (4cm + 8cm)

= 3cm x 12cm

= 36cm^2

REFERENCES

Fountain primary Maths Book 7 pages 177 to 198

MK Book 7 pages 164 to 188

Understanding math Book 7 pages 153 to 189

Macmillan Book 7 pages 112 to 138

Evaluation activity

In each of the following questions;

a) Plot the coordinates
b) Join the points and form polygons
c) Name the polygon
d) Find the area of each of the polygons formed.

1. A(-3, 4), B(3, 4), C(3, -2), D(-3, -2)
2. P(7, 6), Q(1, 6), R(4, 1)
3. M(0, 5), N(-3, 3), O(3, 3), P(0, -8)
4. J(-1, 3), K(3, 3), L(-1, -1)

END OF DATA HANDLING