

Sangam SKM College – Nadi

Lesson Notes – Week 1

Year 9

Mathematics

Strand: Measurement

Sub strand: Money, Ratio, Proportion and Rates

Content Learning Outcome: Recognise and work out ratios, proportions, % and rates.

RATIOS

DEFINITIONS

- It is the division of two quantities with the same unit.
- It is often expressed as a fraction or may also be expressed with a colon which is in the form of $a : b$.
- The ratio must be in its simplest form.
- **Equivalent ratios** are like equivalent fractions: they have the same value

EXAMPLE

In a class of 40 students, there are 16 boys and 24 girls. Write the ratio of boys to girls in the simplest form.

[Answer]

$$\begin{aligned} 16 \text{ boys and } 24 \text{ girls} &= 16 : 24 \\ &= \frac{16}{8} : \frac{24}{8} \text{ (Divide by 8, the highest common factor)} \\ &= 2 : 3 \text{ or } \frac{2}{3} \end{aligned}$$

ACTIVITY

- Express the following in their simplest ratios.
(a) 20 : 12 (b) 25 : 15 (c) 10 : 20
- The fraction $\frac{10}{25}$ when expressed in the simplest ratio is equal to
A. 2 : 5
B. 5 : 2
C. 1 : 4
D. 4 : 1
- Coconut College has 540 students and 18 teachers. Find the student-to-teacher ratio and write it as a simplified fraction.

Strand: Measurement

Sub strand: Money, Ratio, Proportion and Rates

Content Learning Outcome: Simplify ratios and apply to increasing and decreasing quantities

DIVIDING IN A RATIO

DEFINITION

- To divide a number in a ratio, write the ratio as a fraction and then multiply.

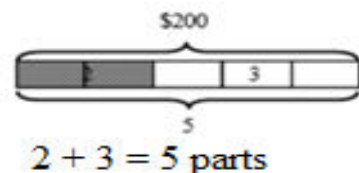
EXAMPLE 1

Two brothers , Tom and Paul, share \$200.00 in the ratio 2:3. How much does each receive?

[Answer]

$$\begin{array}{l} \text{Tom : Paul} \quad 2:3 \\ \text{Tom receives} \quad \frac{2}{2+3} \times \$200.00 = \frac{2}{5} \times \$200.00 \\ \qquad \qquad \qquad = \$80.00 \end{array}$$

$$\begin{array}{l} \text{Paul receives} \quad \frac{3}{2+3} \times \$200.00 = \frac{3}{5} \times \$200.00 \\ \qquad \qquad \qquad = \$120.00 \end{array}$$



EXAMPLE 2

The ratio of Physics students to Geography students at Covid Secondary School is 3: 5. If 20 students are taking Geography, how many students are taking Physics?

Represent physics students as p

Physics : Geography

$$\begin{array}{l} \cancel{3} : \cancel{5} \\ \cancel{p} : 20 \end{array} \quad \text{cross multiply}$$

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

$$3 \times 20 = p \times 5$$

$$60 = 5p$$

$$12 = p$$

(divide both sides by 5)

\therefore 12 students are taking Physics.

ACTIVITY

1. Divide \$300.00 in the following ratios

(a) 1 : 2

(b) 2: 3

(c) 1 : 5

2. Divide the following in the ratio 2: 3.

(a) \$50.00

(b) 80 coconuts

(c) 75 litres of petrol

3. Divide the following in the ratio 3 : 5.

(a) 160 pineapples

(b) 72 cars

(c) 400 boys

Strand: Measurement

Sub strand: Money, Ratio, Proportion and Rates

Content Learning Outcome: Determine when two variable quantities are proportional and perform simple calculation involving proportional variables

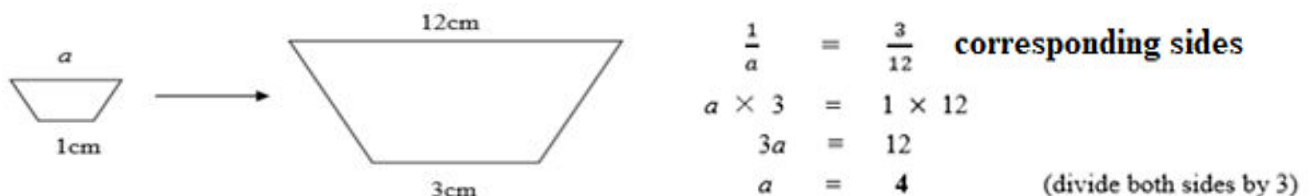
PROPORTIONS

DEFINITION

- It is the comparing and equating of two ratios

EXAMPLE 1

Figure 1 is enlarged to Figure 2. Work out the length of the side marked a.



EXAMPLE 2

Two men made an investment in a business. Mr. Peters contributed \$10,000.00 and Mr. Thomas contributed \$6,000.00.

- Express the two men's contributions as ratio in its simplest form.
- If they were going to share the profit using the above ratio, how much would each man receive if their profit was \$ 9,000.00?

[Answer]

$$\begin{aligned}
 \text{(a) Mr. Peters : Mr. Thomas} &= 10000.00 : 6000.00 \\
 &= 10 : 6 \quad \text{(Divide by 1000)} \\
 &= 5 : 3 \quad \text{(Divide by 2)}
 \end{aligned}$$

$$\text{(b) Mr. Peter's share is } \frac{5}{8} \times \$9000.00 = \$5625$$

$$\text{Mr. Thomas' share is } \frac{3}{8} \times \$9000.00 = \$3375$$

ACTIVITY

- Two women form a partnership in a clothing store. Jane invests \$800 and Hono invests \$600.
 - What is the ratio of the two women's investments?
 - What is the total investments?
 - If the store makes a profit of \$5,000, how should the money be divided?
- In the market, 3kg of fish cost \$16. If the cost is proportional to the weight, how much should 5kg of fish cost?
- The wages Marita earns are proportional to the hours that she works.
 - If Marita earns \$15 for 6 hours of work, how much would she earn for 7 hours?
 - How much would she earn in a week, if she works 40 hours?