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Thursday 8th June 2023.

Ratios Proportions and Percentages.

Proportions:

Direct proportions.
Indirect proportions / inverse.

Direct proportions.

In direct proportions, when one quantity increases, another one also increases and vice versa.

Examples.

1. 2 books cost sh. 8000. Find the cost of 5 similar books.

2 books ⟷ Sh. 8000
1 book ⟷ Sh. $\frac{8000}{2}$
= Sh. 4000
5 books → 5 × sh. 4000
= Sh. 20000

2. A dozen of cups costs sh. 48000. Find the cost of 8 cups.

1 dozen = 12 cups.
12 cups ⟷ Sh. 48000
1 cup ⟷ Sh. $\frac{48000}{12}$
= Sh. 4000
8 cups → 8 × sh. 4000

= sh 32000

3. Given that 4 eggs cost sh 2400. How many eggs can I buy with sh 9600?

4 eggs ⟷ sh 2400

1 egg ⟷ sh $\frac{2400}{4_1}$

= 600

sh 600 ⟷ 1 egg

sh 9600 ⟷ sh $\frac{9600}{600_1}$

= 16 eggs

Activity

A man bought 7 shirts at sh 350000. Find the cost of 3 similar shirts.

7 shirts ⟷ sh 350000

3 shirts ⟷ sh $\frac{3500000}{7_1}$

= sh 50000

sh 50000 ⟷ 7 shirts

sh 3 shirts ⟷ 3 × 50000

= sh 150000

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2. 4 pens cost sh 3200. Find the cost of 2 dozens of similar pens.

4 pens ⟷ Sh. 3200

2 pens ⟷ Sh $\frac{3200}{4}$ = 800

24 pens ⟷ 24 × Sh 800

24 pens ⟷ Sh. 19200

= Sh 19200

3. A car needs 8 litres of petrol to travel 64km. How many kilometres does it travel with 4 litres.

8 litres = 64km

= $\frac{64\text{km}}{8}$ 4

= 8 × 4 litres.

= 32 km

4. 10 apples can be bought at sh 7000. How many apples can be bought with sh 4900?

10 apples ⟷ Sh. 7000

1 apple ⟷ Sh. $\frac{7000}{10}$ = 700

Sh. 700 ⟷ 1 apple

PICFARE

You may delay, but time will not.

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Sh: 4900 ⟷ Sh: 7900
Sh: 700

= 7 apples.

5. Alice bought a grass of pencils at sh 14400. Find the cost of 30 similar pencils.

A grass ⟷ 144
144 pencils ⟷ Sh: 14400 (÷144: 100)
30 pencils ⟷ 30×100
= Sh. 3000

6. A boy bought 6 balls at sh 7200. What was the cost of 2 balls of the same type.

6 balls ⟷ Sh: 7200
2 balls ⟷ Sh: 7200 (÷6: 1200)

= 1200

Sh: 1200 ⟷ 6 balls
2 balls ⟷ 2×1200

= Sh. 2400

1200
× 2
2400

12
× 2
24

Monday 12th June 2023.

Indirect proportions

In indirect proportions, when one quantity increases, another decreases and viceverse.

Examples.

1. 4 girls can weed a garden in 10 days. How many days will 5 girls take to weed the same garden.

4 girls ⟷ 10 days.
1 girl ⟷ (4 × 10) days.
= 40 days.
5 girls ⟷ $\frac{40}{5_1}$ days
= 8 days.

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2. 6 men can take 5 days to build a house. How many days can 10 men take to build the same house.

6 men ⟷ 5 days.
1 man ⟷ (6 × 5) days.
= 30 days.
10 men ⟷ $\frac{\overset{3}{\cancel{30}}}{10_1}$ days
= 3 days.

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3. It takes 9 days for 4 girls to dig a garden. How long will 12 girls take to dig the same garden.

4 girls ⟷ 9 days

1 girl ⟷ (4 × 9) days

= 36 days

12 girls ⟷ $\frac{36}{12_1}$ days

= 3 days

4. 12 men take 5 days to slash a compound. How many men are needed to slash the same compound in 2 days.

12 men ⟷ 5 days

1 man ⟷ (12 × 5) days

= 60 days

2 days ⟷ $\frac{60^{30}}{2_1}$ days

= 30 men.

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Activity:

1. It takes 12 women 4 days to dig a shamba. How long would it take 8 women to do the same job.

12 women ⟷ 4 days.
1 woman ⟷ (12 × 4) days
= 48 days.
8 women ⟷ $\frac{48^{6}}{8_{1}}$ days
= 6 days.

12 × 4 = 48

2. 9 men can build a wall in 14 days. How long will 7 men take to build the same wall.

9 men ⟷ 14 days
1 man ⟷ (14 × 9) days
= 126 days.
7 men ⟷ $\frac{126^{18}}{7_{1}}$ days.
= 18 days.

14 × 9

3. 5 men take 6 days to dig a trench. How long will 3 men take?

5 men 6 days.
1 man (5 × 6) days.
= 30 days.
5 men $\frac{30^{10}}{3_{1}}$ days.
= 10 days.

4. 6 porters can move the compound in 4 days. How many porters will move the same compound in 2 days:

6 porters — 4 days
1 porter — (6 × 4) days
= 24 days
12
2 days — 24 days
2
= 12 days porters

Tuesday 13th June, 2023.

Ratios.

Writing fractions as ratios:

Examples.

Write the following fractions as ratios:

1. $\frac{2}{5} = 2:5$

2. $\frac{3}{8} = 3:8$

3. $\frac{4}{9} = 4:9$

4. $3\frac{1}{4} = \frac{D \times W + N}{D}$

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

$= \frac{13}{4}$

$= 13:4$

1. $\frac{10}{4} = 10:4$

2. $\frac{3}{4} = 3:4$

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

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

5. $\frac{8}{3} = 8:3$

6. $\frac{8}{7} = 8:7$

7. $\frac{5}{2} = 5:2$

8. $\frac{2}{3} = 2:3$

9. $\frac{11}{2} = 11:2$

10. $\frac{15}{3} = 15:3$

Writing ratios as fractions:

Write the following ratios as fractions.

(a) $\frac{1}{5}$ 2:5 : $\frac{2}{5}$

(b) $\frac{3}{2}$ = 3:2

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

(c) 4:6 = $\frac{4 \div 2}{6 \div 3}$

= $\frac{2}{3}$

(d) 3:7 = $\frac{3}{7}$

(e) 4:9 = $\frac{4}{9}$

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

Increasing and decreasing quantities using ratios:

* To increase or decrease in ratios, write the ratio as a fraction and multiply it by the given quantity.

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Examples:

1. Increase Sh. 6000 in the ratio 3:2.

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

$\frac{3}{2_1} \times Sh.\ \overset{3000}{\cancel{6000}}$

$= 3 \times Sh.\ 3000$

$= Sh.\ 9000$

2. Decrease 180 mangoes in the ratio of 5:6

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

$\frac{5}{\cancel{6}_{\overset{1}{\cancel{2}}_1}} \times \overset{30}{\cancel{180}}$ mangoes.

$= 5 \times 30$ mangoes.

$= 150$ mangoes.

Activity

1. Write the following fractions as ratios.

(a) $\frac{4}{6} = 4:6$

$2:3$ ✓

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(b) $3\frac{2}{5} = \frac{D \times W + N}{D}$

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

$= \frac{17}{5}$

9/5

(c) $\frac{5}{6} = 5:6$

2. Write the following ratios as fractions:

(a) $2:7 = \frac{2}{7}$

(b) $8:18 = \frac{8}{18}$

(c) $3:2 = \frac{3}{2}$

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

3. Decrease 280 pupils in the ratio 3:4.

$3:4 = \frac{3}{4}$

$\frac{3}{4} \times 280$ pupils

$= 3 \times 70$ pupils

$= 210$ pupils

70
×3
0

Success has a simple formular do your best, and people may like it.

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4. A school had 500 pupils if they have increased in the ratio 6:5, find the new number of pupils in the school.

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

$= \frac{6}{\cancel{5}_1} \times \overset{100}{\cancel{500}}$ pupils

6×100 pupils

$= 600$ pupils.

5. Increase 1600 eggs in the ratio 5:4

$5:4 = \frac{5}{4}$

$\frac{5}{\cancel{4}_1} \times \overset{400}{\cancel{1600}}$ eggs.

$= 5 \times 400$ eggs

$= 2000$ eggs.

$\begin{array}{r} 3480 \\ \times \quad 2 \\ \hline 3960 \end{array}$

$\begin{array}{r} 400 \\ 5 \\ \hline 2000 \end{array}$

Revision work

1. Decrease 600 in a ratio of 2:3

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

$\frac{2}{\cancel{3}_1} \times \overset{400}{\cancel{600}}$

$= 400$

2. Decrease 400kg in a ratio of 2:5

$2:5 = \frac{2}{5}$

$\frac{2}{5_1} \times 400^{80}$ kg

2×80 kg

$= 160$ kg.

3. Decrease shs 1,000 in a ratio of 3:5

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

$\frac{3}{5_1} \times 1000^{200}$

3×200

$= 600$

4. Decrease 800 litres in a ratio of 5:8

$5:8 = \frac{5}{8}$

$\frac{5}{8_1} \times 800^{400}$ litres

5×400 litres

2000 litres.

5. Obbo's daily income was shs 15000. If decreased in a ratio of 9:10. What is his new income?

$9:10 = \frac{9}{10}$

$\frac{9}{10_{1}} \times \overset{3000}{\cancel{30000}}$

9×3000

$= 27000$

6. Decrease 700 bags of cement in a ratio of 7:10

$7:10 = \frac{7}{10}$

$\frac{7}{10_{1}} \times \overset{70}{\cancel{700}}$ bags

7×70 bags.

$= 490$ bags.

7. Decrease 9,480 in a ratio of 2:3

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

$\frac{2}{\cancel{3}_{1}} \times \overset{316}{\cancel{9,480}}$.

2×316

$= \cancel{6320} = 632$

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Thursday 15th June 2023

Sharing in ratios:
Examples.

1. John and Joan shared 60 mangoes in the ratio 2:4. How many mangoes did each get?

John	Joan	Total
2	4	6

Total ration = 2+4
= 6 parts

6 parts — 60 mangoes.
1 part — $\left(\frac{60^{10}}{6_1}\right)$
= 10 mangoes

John
2 parts → (2×10)
= 20 mangoes.

Joan
4 parts → 4×10
= 40 mangoes.

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2. A father shared sh. 240000 among his daughter Grace and Annet in the ratio 2:3. How much money did each get?

Grace	Annet	Total	
2	3	5	sh. 240000

Total ratio = 2+3
= 5

5 parts → sh. 240000

1 part → $\frac{\text{sh. } 240000}{5}$

= sh. 48000

Grace

2 parts → 2 × sh. 48000

= sh. 96000

Annet

3 parts → 3 × 48000

= sh. 144000

3.

Three boys Alex, Allan and Robert shared 480 books in the ratio 2:3:5 respectively. How many books did each boy get?

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Alex	Allan	Robert	Total
2	3	5	10

Total ration = 2+3+5

= 10 parts.

10 parts → 480 books

1 part → $\left(\frac{480}{10}\right)$

= 48 books.

Alex

2 parts → 2 x 48 books

= 96 books.

Allan

3 parts → 3 x 48 books.

= 144 books

Robert

5 parts → 5 x 48 books.

240 books.

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4. Job, Joash and Jackie shared some pens in the ratio 1:3:4. If Jackie got 24 pens:

(a) How many pens did they share altogether.

Job	Joash	Jackie	Total
1	3	4	8

4 parts → 24 pens
1 part → $\frac{24}{4}$
= 6 pens.

Total pens
8 parts (8×6)
= 48 pens.

(b) Job
1 part = 6 pens.
Joash
3 parts → 3×6 pens
= 18 pens.

Jackie → 24 pens.

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Activity.

1. Mr. Mukibi shared his 80 acres of land his three sons keneth, kato and Musa in ratio 2:3:5 respectively.

keneth	kato	Musa	Total
2	3	5	10

Total ratio = 2+3+5 = 10.

10 parts ⟶ 80 acres

1 part ⟶ $\left(\frac{80}{10}\right)$

= 8 acres

keneth

2 parts ⟶ 2×8 acres

= 16 acres

kato

3 parts ⟶ 3×8 acres

= 24 acres

Musa

5 parts ⟶ 5×8 acres

= 40 acres

2. A man shared pocket money among his children Cate, Jane and Moses in the ratio 2:3:4 respectively. If Jane got Sh. 45000

(a) How much money did they share altogether.

Cate	Jane	Moses	Total
2	3	4	9

Total ratio = 2+3+4 = 9

3 parts → Sh. 45000

1 part → $\frac{45000}{3}$ = Sh. 15000

Total money

9 parts (9 x Sh 15000

Sh = 135,000

(b) Cate

2 parts → 2 x 15,000

Sh. 30,000

Jane

= Sh. 45000

Moses

4 parts → 4 x 15000

Sh. 60,000

2
15000
x 4
60,000

10

4x1=4+2

4
15000
x 9
135000

45

9x1=9+4

15000

10

2x2=4