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(TOPICS • PROBLEM SOLVING HEURISTICS)

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*More challenging problems especially for advanced pupils.

4.1 RESTATE IN ANOTHER WAY 1**EXAMPLE 1**

A plot of land is divided into 3 parts A, B and C.

Area A is $\frac{1}{2}$ of Area B. Area B is $\frac{3}{4}$ of Area C.

- Find the ratio of Area A to Area B to Area C.
- Given that Area A is 900 m^2 smaller than Area C, what is the area of the plot of land?

SOLUTION:**THINK**

First, convert the fractions into ratios.

Then, make B's ratio units the same in both situations.

6 is the smallest common multiple of 2 and 3. So, make 6 the ratio units for B.

- $$A : B = 1_{\times 3} : 2_{\times 3} = 3 : 6$$

$$B : C = 3_{\times 2} : 4_{\times 2} = 6 : 8$$

Therefore, $A : B : C = 3 : 6 : 8$

The ratio of Area A to Area B to Area C is $3 : 6 : 8$.

- $$8 - 3 = 5 \text{ units (C - A)}$$

$$5 \text{ units} \rightarrow 900 \text{ m}^2$$

$$1 \text{ unit} \rightarrow 900 \div 5 = 180 \text{ m}^2$$

$$3 + 6 + 8 = 17 \text{ units (Total)}$$

$$17 \text{ units} \rightarrow 17 \times 180 = 3060 \text{ m}^2$$

The area of the plot of land is 3060 m^2 .

4.2 RESTATE IN ANOTHER WAY 2

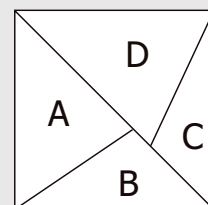
EXAMPLE

A square is divided into four parts A, B, C and D as shown.

The ratio of Area A to Area B is 4 : 3.

The ratio of Area B to Area C is 2 : 1.

- a) Find the ratio of Area A to Area B to Area C.
b) Area D is 220 cm^2 . Find the area of the square.



SOLUTION:

THINK

Make Area B's ratio units the same in both situations.
6 is the smallest common multiple of 2 and 3. So,
make 6 the ratio units for Area B.

a) Area A : **Area B** = $4_{\times 2} : 3_{\times 2} = 8 : 6$

Area B : Area C = $2_{\times 3} : 1_{\times 3} = 6 : 3$

Therefore, Area A : **Area B** : Area C = $8 : 6 : 3$

The ratio of Area A to Area B to Area C is 8 : 6 : 3.

b)

Area A + Area B = Area C + Area D
($\frac{1}{2}$ of area of square)

Area D = Area A + Area B - Area C = $8 + 6 - 3 = 11$ units

Area of square = $2 \times (8 + 6) = 28$ units

11 units $\rightarrow 220$ (D)

1 unit $\rightarrow 220 \div 11 = 20$

28 units $\rightarrow 20 \times 28 = 560$ (Square)

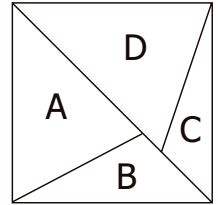
The area of the square is 560 cm^2 .

WORKSHEET 4.2

Solve the problems. Show your working clearly.

1. A square is divided into four parts A, B, C and D as shown. The ratio of Area A to Area B is 2 : 1. The ratio of Area B to Area C is 3 : 2.

- a) Find the ratio of Area A to Area B to Area C.
b) Find the ratio of Area C to Area D.



2. The rectangle below is divided into four parts A, B, C and D as shown. The area of A is $\frac{1}{4}$ the area of B. The ratio of the area of B to the area of C is 2 : 1. Find the ratio of the area of D to the area of C.

