CONTENTS

(TOPICS • PROBLEM SOLVING HEURISTICS)

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

b) 8 - 3 = 5 units (C - A)
5 units → 900 m^2
1 unit → 900 ÷ 5 = 180 m^2
3 + 6 + 8 = 17 units (Total)
17 units → 17 x 180 = 3060 m^2

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

Worksheet 4.1

Solve the problems. Show your working clearly.

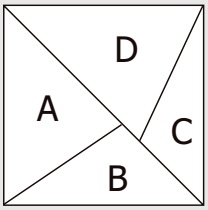
1. Three children collected some stamps. The number of stamps Joey collected is $\frac{1}{6}$ that of Sam's. The number of stamps Linda collected is $\frac{3}{4}$ that of Sam's. Find the ratio of the number of Joey's stamps to that of Sam's to that of Linda's.

2. Helen's age is $\frac{1}{2}$ of Ray's age. Ray's age is $\frac{4}{7}$ of Danny's age. Given that Danny is 15 years older than Helen, how old is Ray?

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 x (8 + 6) = 28 units

11 units → 220 (D)

1 unit → 220 ÷ 11 = 20

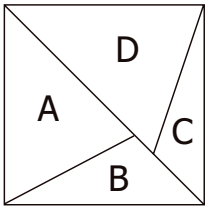
28 units → 20 x 28 = 560 (Square)

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.