



## Problem of the Week

### Problem C and Solution

#### Chip to Chip

#### Problem

Mr. Chips has a bin full of bingo chips. The ratio of the number of red chips to the number of blue chips is  $1 : 4$ , and the ratio of the number of blue chips to the number of green chips is  $5 : 2$ .

What is the ratio of the number of red chips to the number of green chips?

#### Solution

##### Solution 1

We start by assuming that there are 20 blue chips. (We pick 20 since the ratio of red chips to blue chips is  $1 : 4$  and the ratio of blue chips to green chips is  $5 : 2$ , so we pick a number of blue chips which is divisible by 4 and by 5. Note that we did not have to assume that there were 20 blue chips, but making this assumption makes the calculations much easier.)

Since there are 20 blue chips and the ratio of the number of red chips to the number of blue chips is  $1 : 4$ , then there are  $\frac{1}{4} \times 20 = 5$  red chips.

Since there are 20 blue chips and the ratio of the number of blue chips to the number of green chips is  $5 : 2$ , then there are  $\frac{5}{2} \times 20 = 8$  green chips.

Therefore, the ratio of the number of red chips to the number of green chips is  $5 : 8$ .

##### Solution 2

Let  $r$  represent the number of red chips.

Since the ratio of the number of red chips to the number of blue chips is  $1 : 4$ , then the number of blue chips is  $4r$ .

Since the ratio of the number of blue chips to the number of green chips is  $5 : 2$ , then the number of green chips is  $\frac{2}{5} \times 4r = \frac{8}{5}r$ .

Since the number of red chips is  $r$  and the number of green chips is  $\frac{8}{5}r$ , then the ratio of the number of red chips to the number of green chips is  $1 : \frac{8}{5} = 5 : 8$ .