



## Problem of the Week

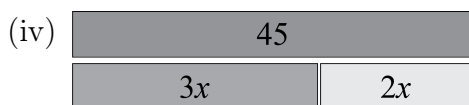
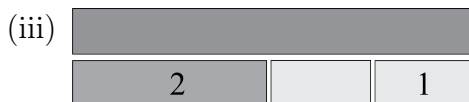
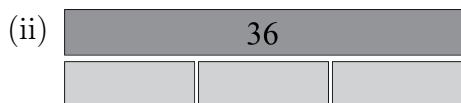
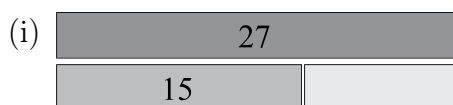
### Problem B and Solution

### Composed or Decomposed

#### Problem

A bar model contains two rows of rectangles. The top row is a rectangle with a value equal to the total, and the bottom row contains rectangles whose values sum to the total. All values are whole numbers.

- (a) Determine the numbers missing from each of the bar models below. In each part, rectangles that are the same shade of grey have the same value.



- (b) (i) In the bar model shown, the rectangles in the bottom row all have the same value. What are some equations this bar model could represent?



- (ii) Describe all possible whole numbers that could appear in the top row of this bar model.





## Solution

- (a) (i) Since  $27 = 15 + 12$ , the missing number is 12.
- (ii) Since  $36 \div 3 = 12$ , the missing number is 12.
- (iii) Since rectangles that are the same shade of grey have the same value, the rectangle in the second row with unknown value has value 1. Thus, the missing number in the top row is  $2 + 1 + 1 = 4$ .
- (iv) From the bar model, we know  $45 = 3x + 2x = 5x$ .  
Therefore, 45 is divided into 5 equal parts. Since  $45 \div 5 = 9$ , we know  $x = 9$ . So the two numbers in the bottom row are  $3 \times 9 = 27$  and  $2 \times 9 = 18$ .
- (b) (i) Answers will vary. Some equations that the bar model could represent include

$$5 \div 5 = \mathbf{1}$$

$$10 \div 5 = \mathbf{2}$$

$$15 \div 5 = \mathbf{3}$$

$$20 \div 5 = \mathbf{4}$$

$$\mathbf{3} \times 5 = 15$$

$$\mathbf{7} \times 5 = 35$$

In each equation, the number in boldface would appear in each of the five rectangles in the bottom row.

- (ii) The whole numbers that could appear in the top row are the positive multiples of 5. That is, 5, 10, 15, 20, 25, and so on.