IllustrativeMathematics

6.EE Rectangle Perimeter 1

Alignment 1:6.EE.A.2

- Ana computes the perimeter of a rectangle by adding the length, l and width, w and doubling this sum.
- Bryan computes the perimeter of a rectangle by doubling the length, l, doubling the width, w, and adding the doubled amounts.

- a. Write an expression for Ana's way of calculating, and an expression for Bryan's way.

- b. Use each expression to find the perimeter of a rectangle with length 30 and width 75.

- c. Show why Ana and Bryan always get the same answer.

Commentary:
This task gives a verbal description for computing the perimeter of a rectangle and asks the students to find an expression for this perimeter. They then have to use the expression to evaluate the perimeter for specific values of the two variables. In this problem, the variable names l and w convey the meaning of length and width of a rectangle. A follow up to this task is Rectangle Perimeter 2, where students are asked to determine if expressions for the perimeter of a rectangle are correct and equivalent.

Solution: Writing an expression

a. For Ana, the description for computing the perimeter of a rectangle first adds the length l and the width w of the rectangle

$$l + w$$

Then it asks us to double this sum, that means we are taking the sum and multiplying it by 2:

$$\text{perimeter of a rectangle} = 2(l + w)$$

b. B's way for computing the perimeter of a rectangle first doubles the length, l and the width w of the rectangle, then adds them together.

$$\text{Perimeter of a rectangle} = 2l + 2w$$

c. Letting $l = 30$ and $w = 75$ we have

$$\text{perimeter of this rectangle} = 2(30 + 75) = 2(105) = 210, \text{ or, equivalently,}$$
$$= (2 \times 30) + (2 \times 75) = 60 + 150 = 210$$

d. The expressions will always yield the same answer because of the distributive property of multiplication over addition.

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