



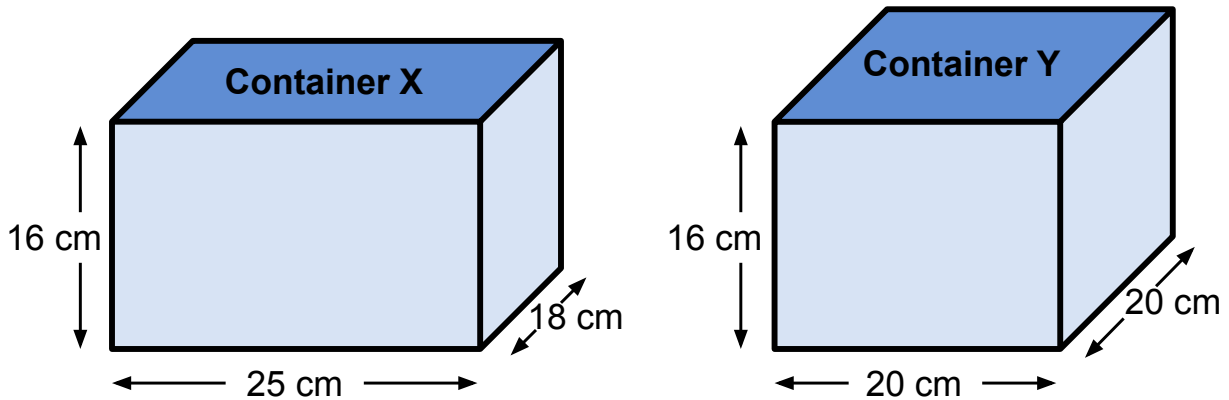
## Problem of the Week

### Problem A and Solution

#### Storage Containers

#### Problem

Jillian has two plastic containers that are the same height. The dimensions of these containers are shown below:



She always seals her containers with a lid when she stores things.

- A) If Jillian filled each container with water, which container would hold more water? Justify your answer.
- B) Jillian has many wooden blocks that are cubes with side lengths of 4 cm. Which container would hold more blocks if the blocks had to lie flat in the container? Justify your answer.

#### Solution

- A) Since the containers are the same height, the capacity of each will depend on the area of each base. By either using the formula  $area = length \times width$ , or by drawing the bases on grid paper, we see that:

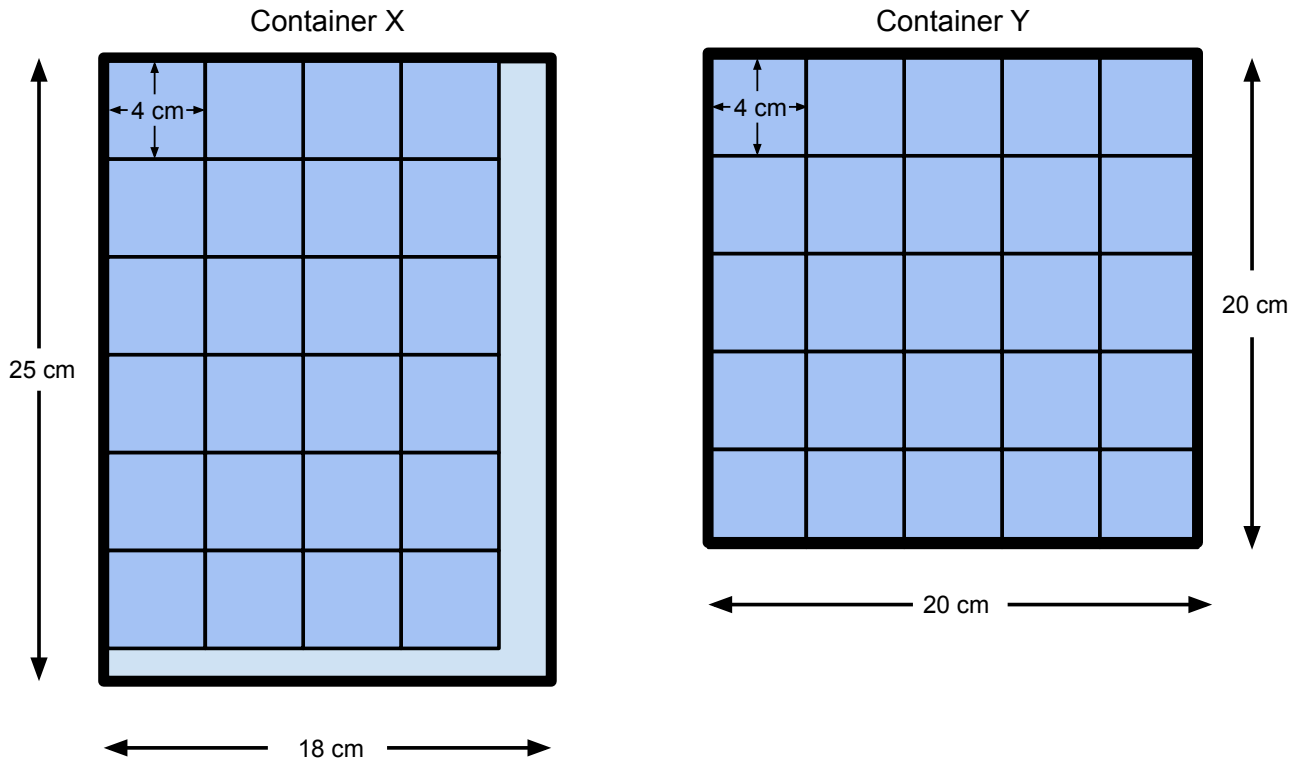
$$\text{Area of the base of Container X} = 25 \times 18 = 450 \text{ cm}^2.$$

$$\text{Area of the base of Container Y} = 20 \times 20 = 400 \text{ cm}^2.$$

Since the area of the base of Container X is greater than the area of the base of Container Y, that tells us Container X would hold more water.



B) To maximize the number of blocks in each container, Jillian can stack layers of blocks, where each layer is a rectangle made of blocks lying flat. The diagram below shows the largest rectangle of blocks that will fit in each container.



When we count the blocks, we see that  $6 \times 4 = 24$  blocks can fit in one layer in Container X, while  $5 \times 5 = 25$  blocks can fit in one layer in Container Y. Therefore Container Y can store more of these blocks than Container X.