

Prism Word Problems Worksheets

A right rectangular prism with length of 10 in, width of 16 in, and height of 12 in is $\frac{2}{3}$ filled with water. If the water is emptied into another right rectangular prism with a length of 12 in, a width of 12 in, and height of 9 in, will the second container hold all of the water? Explain why or why not. Determine how far (above or below) the water level would be from the top of the container)

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$$\frac{2}{3} \cdot 12 \text{ in} = \frac{24}{3} \text{ in} = 8 \text{ in}$$

The height of the water in the first prism is 8 in.

$$V = Bh = (lw)h$$

$$V = (10 \text{ in} \cdot 16 \text{ in}) \cdot 8 \text{ in}$$

$$V = 160 \text{ in}^2 \cdot 8 \text{ in}$$

$$V = 1,280 \text{ in}^3$$

The volume of water is 1,280 in³.

$$V = Bh = (lw)h$$

$$V = (12 \text{ in} \cdot 12 \text{ in}) \cdot 9 \text{ in}$$

$$V = 144 \text{ in}^2 \cdot 9 \text{ in}$$

$$V = 1,296 \text{ in}^3$$

The capacity of the second prism is 1,296 in³, which is greater than the volume of water, so the water will fit in the second prism.

$$V = Bh = (lw)h$$

Let h represent the depth of the water in the second prism in inches.

$$1,280 \text{ in}^3 = (12 \text{ in} \cdot 12 \text{ in}) \cdot h$$

$$1,280 \text{ in}^3 = (144 \text{ in}^2) \cdot h$$

$$1,280 \text{ in}^3 \cdot \frac{1}{144 \text{ in}^2} = 144 \text{ in}^2 \cdot \frac{1}{144 \text{ in}^2} \cdot h$$

$$\frac{1,280}{144} \text{ in} = 1 \cdot h$$

$$8 \frac{128}{144} \text{ in} = h$$

$$8 \frac{8}{9} \text{ in} = h$$

The depth of the water in the second prism is $8 \frac{8}{9}$ in.

$$9 \text{ in} - 8 \frac{8}{9} \text{ in} = \frac{1}{9} \text{ in}$$

The water level will be $\frac{1}{9}$ in from the top of the second prism.