

Lessons 23-26 Problem Set for Grade 7

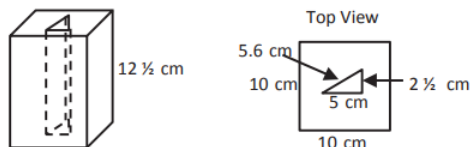
Name:

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G7-M3-L23-26

Problem Set Solutions

1. A child's toy is constructed by cutting a right triangular prism out of a right rectangular prism.



- a. Calculate the volume of the rectangular prism.

$$10 \text{ cm} \times 10 \text{ cm} \times 12 \frac{1}{2} \text{ cm} = 1250 \text{ cm}^3$$

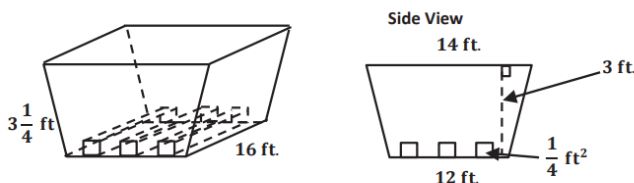
- b. Calculate the volume of the triangular prism.

$$\frac{1}{2} \left(5 \text{ cm} \times 2 \frac{1}{2} \text{ cm} \right) \times 12 \frac{1}{2} \text{ cm} = 78 \frac{1}{8} \text{ cm}^3$$

- c. Calculate the volume of the material remaining in the rectangular prism.

$$1250 \text{ cm}^3 - 78 \frac{1}{8} \text{ cm}^3 = 1171 \frac{7}{8} \text{ cm}^3$$

2. A landscape designer is constructing a flower bed in the shape of a right trapezoidal prism. He needs to run three identical square prisms through the bed for drainage.



- a. What is the volume of the bed without the drainage pipes?

$$\frac{1}{2} (14 \text{ ft} + 12 \text{ ft}) \times 3 \text{ ft} \times 16 \text{ ft} = 624 \text{ ft}^3$$

- b. What is the total volume of the three drainage pipes?

$$3 \left(\frac{1}{4} \text{ ft}^2 \times 16 \text{ ft} \right) = 12 \text{ ft}^3$$

- c. What is the volume of soil if the planter is filled to $\frac{3}{4}$ of its total capacity with the pipes in place?

$$\frac{3}{4} (624 \text{ ft}^3) - 12 \text{ ft}^3 = 456 \text{ ft}^3$$

- d. What is the height of the soil? If necessary, round to the nearest tenth.

$$\frac{456 \text{ ft}^3}{\frac{1}{2} (14 \text{ ft} + 12 \text{ ft}) \times 16 \text{ ft}} \approx 2.2 \text{ ft.}$$