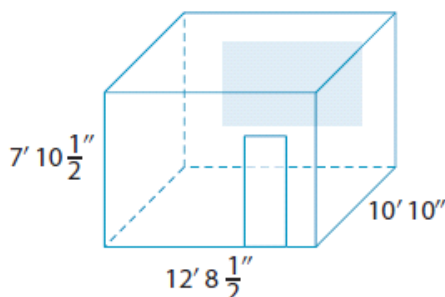


## On the Job 2

### Determining Degree of Precision

Greg is redecorating a bedroom in his house. He knows that his measurements need to be accurate, but the degree of precision required depends on the job.

- a) Greg wants to determine how much paint to buy. The dimensions of the room are  $12' 8\frac{1}{2}''$  by  $10' 10''$ . The ceiling is  $7' 10\frac{1}{2}''$  high. What degree of precision does he need for the room's measurements? How much paint should he buy?



- b) Greg is also replacing the door and window casing. The door frame measures  $80''$  by  $30''$ . The door casing will be installed so that about  $\frac{1}{8}''$  of the door frame is exposed.

### Solution

- a) When determining how much paint to buy, the measurements do not need to be precise.

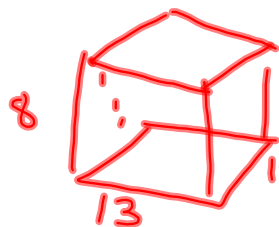
Greg rounds the room dimensions to 13' long by 11' wide by 8' high.

$$\begin{aligned} \text{Area of longer walls} &= (13 \times 8) \times 2 \\ &= 208 \end{aligned}$$

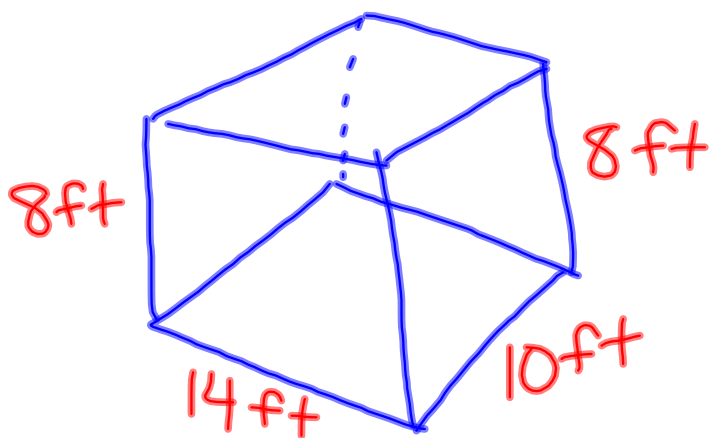
$$\begin{aligned} \text{Area of shorter walls} &= (11 \times 8) \times 2 \\ &= 176 \end{aligned}$$

Greg will put two coats of paint on the walls.

$$\begin{aligned} \text{Total area} &= (208 + 176) \times 2 \\ &= 384 \times 2 \\ &= 768 \end{aligned}$$



Greg does not subtract the area of the doors and windows. Instead, he estimates how much less paint he will need. Greg decides he needs to buy enough paint to cover about 750 square feet.



$$2 \begin{array}{|c|} \hline \square \\ \hline \end{array} \begin{array}{l} 8 \\ 14 \end{array} \Rightarrow 2 \times (8 \times 14) = 224$$

$$2 \begin{array}{|c|} \hline \square \\ \hline \end{array} \begin{array}{l} 8 \\ 10 \end{array} \Rightarrow 2 (8 \times 10) = 160$$

$$224 + 160 = 384 \text{ square ft.}$$

### Determining Accuracy

Vic and his son are going to pour a concrete pad before building a shed. They want the pad to be 12 ft long, 8 ft wide, and 4 in. thick.

Vic's son wants to calculate the volume of the concrete needed.

He knows that

volume = length  $\times$  width  $\times$  height (or thickness).

$$V = lwh$$

$$V = 12 \times 8 \times 4$$

$$V = 392$$

Vic's son says, "We need 392 cubic feet of concrete."

Vic says, "No way. We need only 32 cubic feet."

- Whose calculation is accurate? Explain.
- Is it important for this calculation to be accurate? Explain.



Height can also be thickness.

### Solution

- The son's calculation was  $12 \times 8 \times 4$ , which is 392. However, the 12 and the 8 are measurements in feet, while the 4 is a measurement in inches. To have a volume in cubic feet, all of the measurements must be in feet. The son's calculation was not accurate. The measurements were right, but they were not used properly.

Vic shows his son how to do the calculation:

$$V = 12 \times 8 \times \frac{1}{3}$$

$$V = 32$$

Vic's calculation is accurate.

They need 32 ft<sup>3</sup> of concrete.

4 in. is  $\frac{1}{3}$  of a foot.

$$12 \times 8 = 96$$

$\frac{1}{3}$  of 96 is 32.

- Yes, it is important for the calculation to be accurate. If the calculated amount of concrete needed is too low, they will not have enough to complete that job. If it is too high, they will have bought too much concrete mix, and may not be able to return it for a refund.

### Your Turn

Calculate the volume of concrete needed for a pad that measures 20 ft by 10 ft by 6 in.

2. Determine the amount of cement needed for a concrete pad that measures 13ft by 9 ft by 3in.

$$V = lwh$$

\* all measures in same  
units!

$$* 3\text{in} = \frac{1}{4}\text{ft}$$

$$13\text{ft} \times 9\text{ft} \times \frac{1}{4}\text{ft} \\ = 29.25 \text{ft}^3$$