

Solutions

Apply Your Learning

Problem 1

You're going to build your little cousin a sand box that is going to fit into the corner of his family's lot. It will be in the shape of a right isosceles triangle and is to have an area of 64 ft².

i) What lengths of wood will you need to construct the sand box? Round the lengths to the ^{nearest} next largest foot.

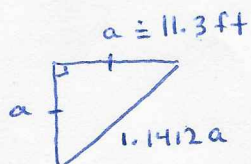
To find the side lengths, use $A = \frac{a^2}{2}$.

$$\text{Set } A = 64 \text{ ft}^2: \quad 64 = \frac{a^2}{2} \xrightarrow{\times 2} 128 = a^2 \rightarrow \sqrt{128} = a$$

$$11.3 \text{ ft} \approx a$$

ii) If you're going to have to pay \$2 per foot, what will be the cost of the wood (before taxes)?

i) CONTINUED.



The last side length is given by $1.1412a$.

$$1.1412(11.3) \approx 12.9 \text{ ft}$$

∴ To the nearest foot, the sand box will have side lengths of 11 ft, 11 ft, and 13 ft.

$$\begin{aligned} \text{ii) At } \$2/\text{ft, Cost} &= \$2(11 + 11 + 13) \\ &= \$2(35) \\ &= \$70 \end{aligned}$$

Problem 2

Your cousin's neighbour happens to have a sandbox—also in the shape of a right isosceles triangle. The perimeter of the box is 45 feet.

What is the area of the neighbour's sandbox? Round to the nearest square foot.

$$\text{Again, } A = \frac{a^2}{2}$$

Since $P = 3.1412a$, substitute $P = 45 \text{ ft}$ and solve for 'a'.

$$45 = 3.1412a$$

$$\frac{45}{3.1412} = a$$

$$14.3 \approx a$$

$$A = \frac{a^2}{2} \rightarrow \frac{(14.3)^2}{2} \rightarrow 102.25 \approx 102 \text{ ft}^2$$