

1.7 Solve Problems Using Diagrams

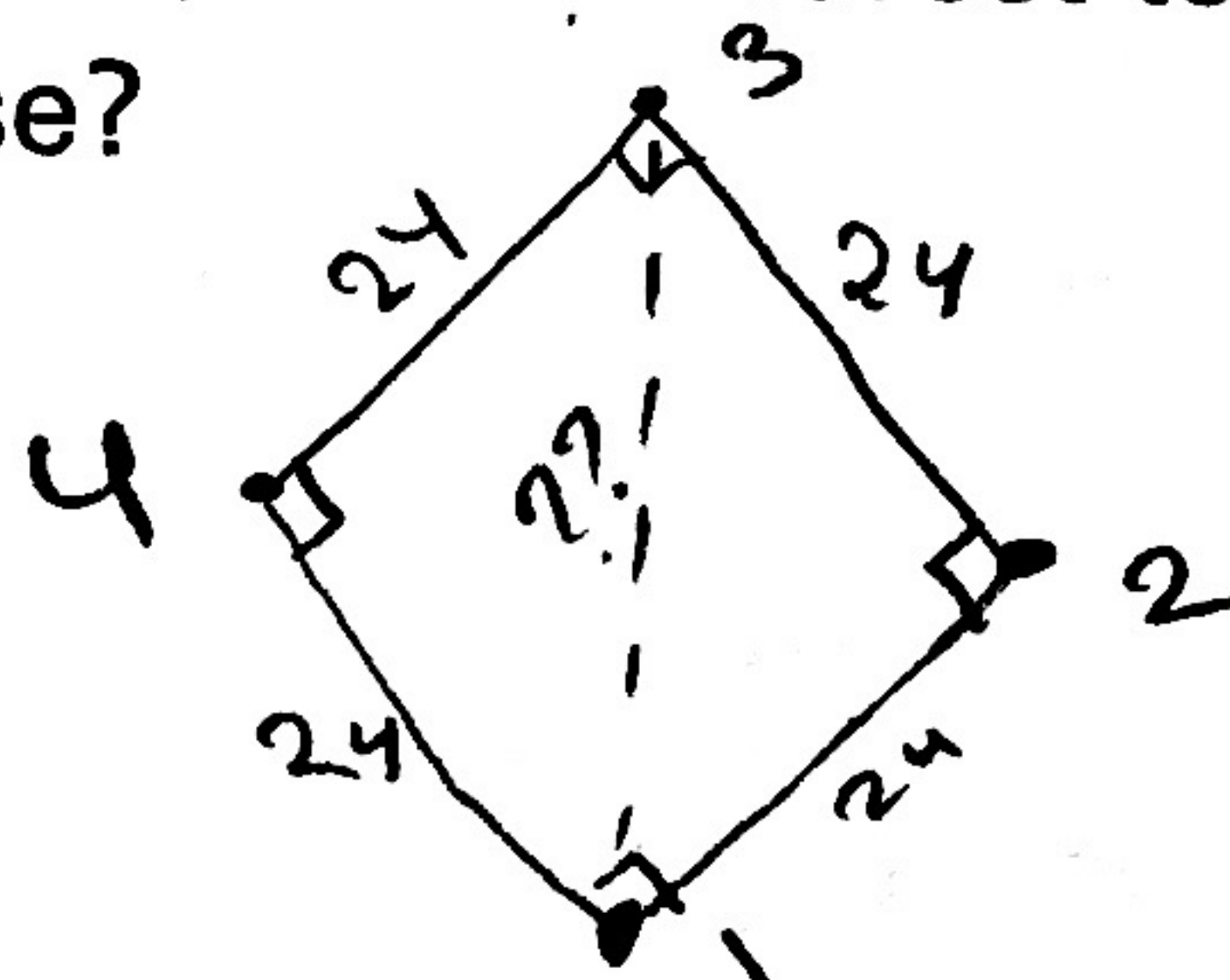
GOAL

Use diagrams to solve problems about squares and square roots.

Draw a diagram to help you solve each problem.

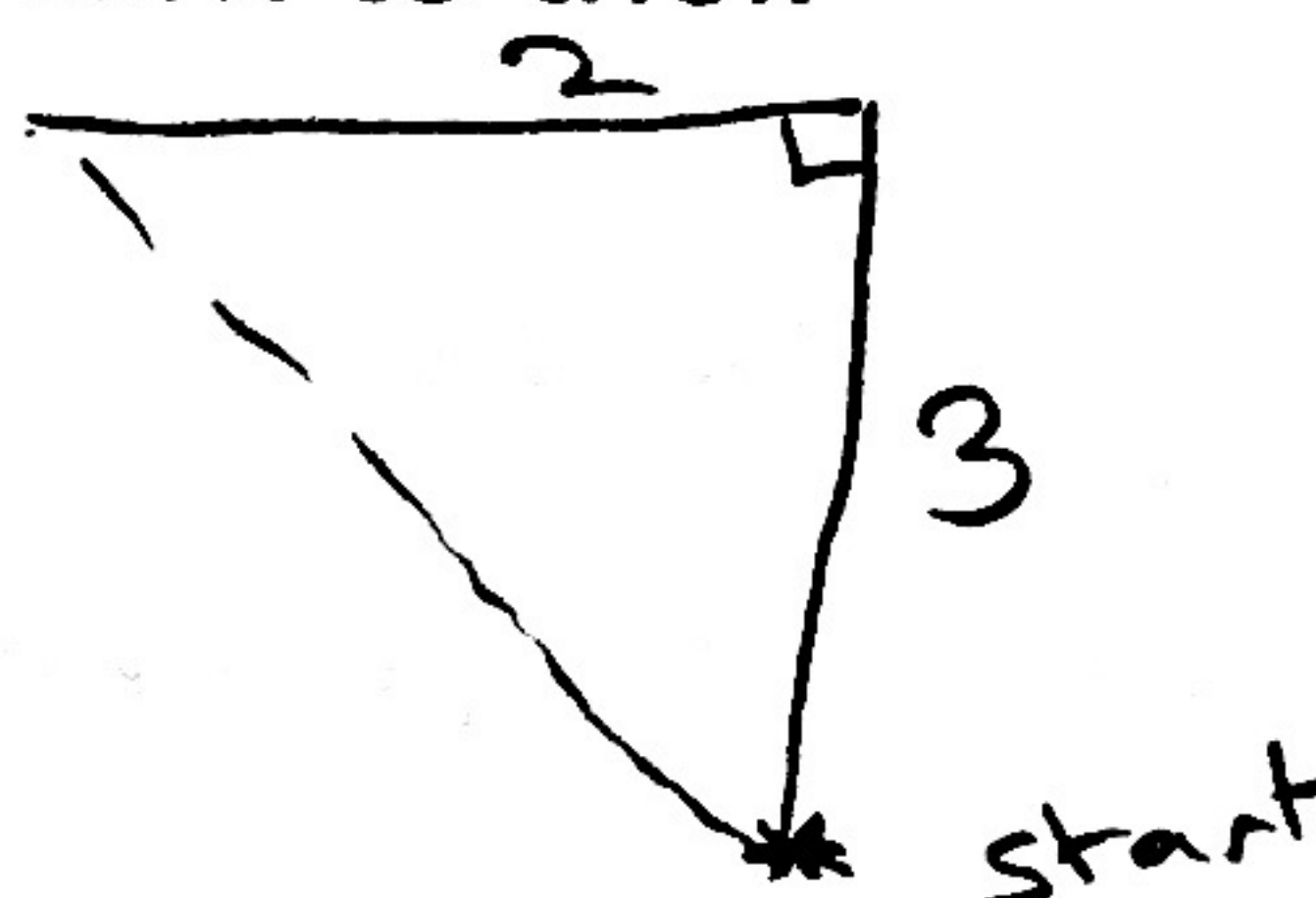
1. A baseball diamond is a square with sides of about 24 m. What is the shortest distance, to the nearest tenth, between first base and third base?

$$\begin{aligned} c^2 &= (24)^2 + (24)^2 \\ &= 576 + 576 \\ c &= \sqrt{1152} \approx 33.9 \end{aligned}$$



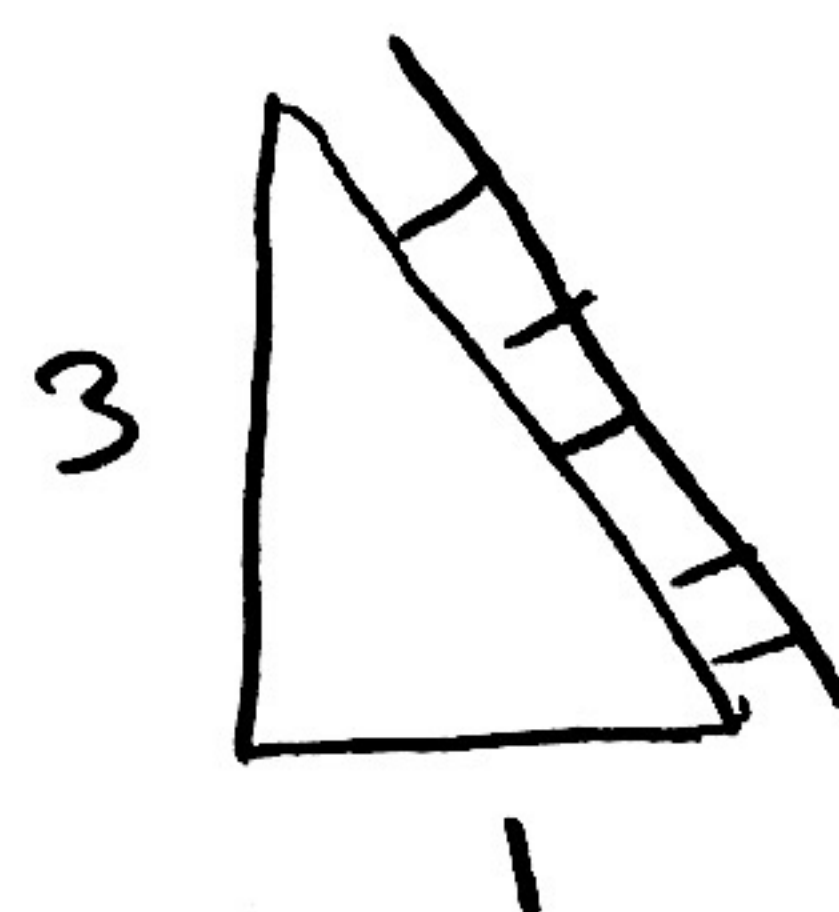
2. Two joggers ran 3 km north, then 2 km west. What is the shortest distance they must travel to return to their starting point?

$$\begin{aligned} c^2 &= (3)^2 + (2)^2 \\ &= 9 + 4 = 13 \\ c &= \sqrt{13} \approx 3.6 \end{aligned}$$



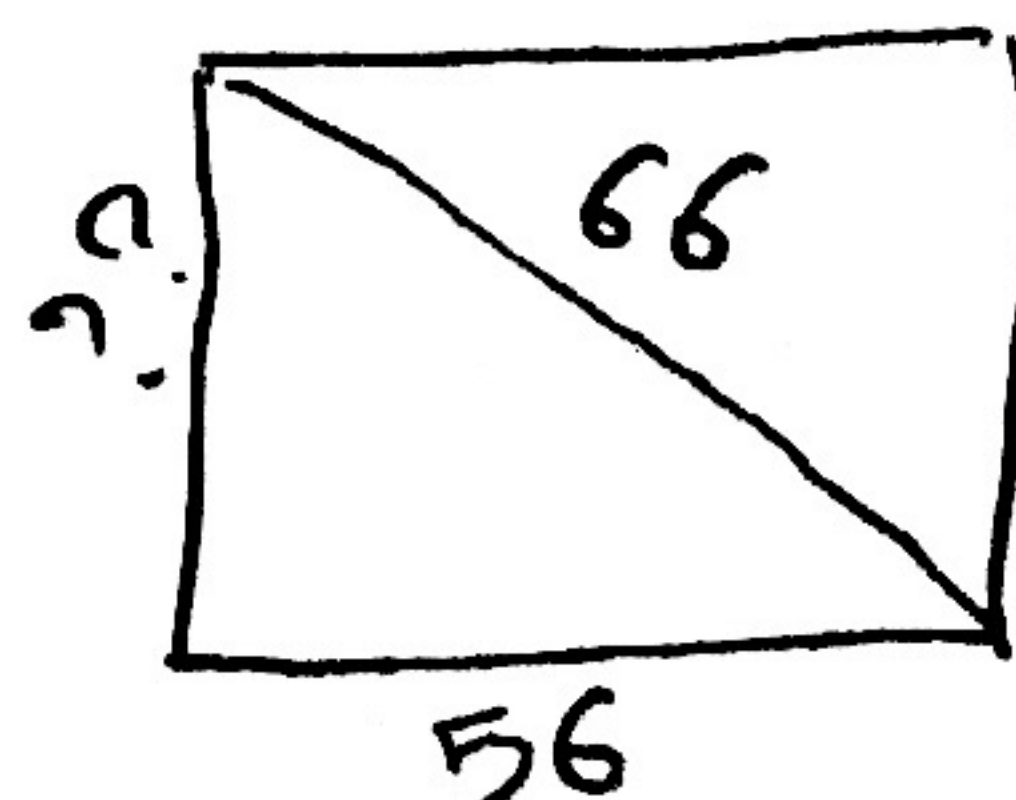
3. The foot of a ladder is placed 1 m away from a wall. The top of the ladder rests 3 m up the wall. How long is the ladder?

$$\begin{aligned} c^2 &= 9 + 1 \\ &= 10 \\ c &= \sqrt{10} \approx 3.2 \end{aligned}$$



4. Daisy's TV screen is 56 cm long and 66 cm diagonally. How wide is Daisy's TV?

$$\begin{aligned} 43\ 56 &= 3136 + b^2 \\ 1220 &= b^2 \\ \sqrt{1220} &= b \\ 34.9 &\approx b \end{aligned}$$



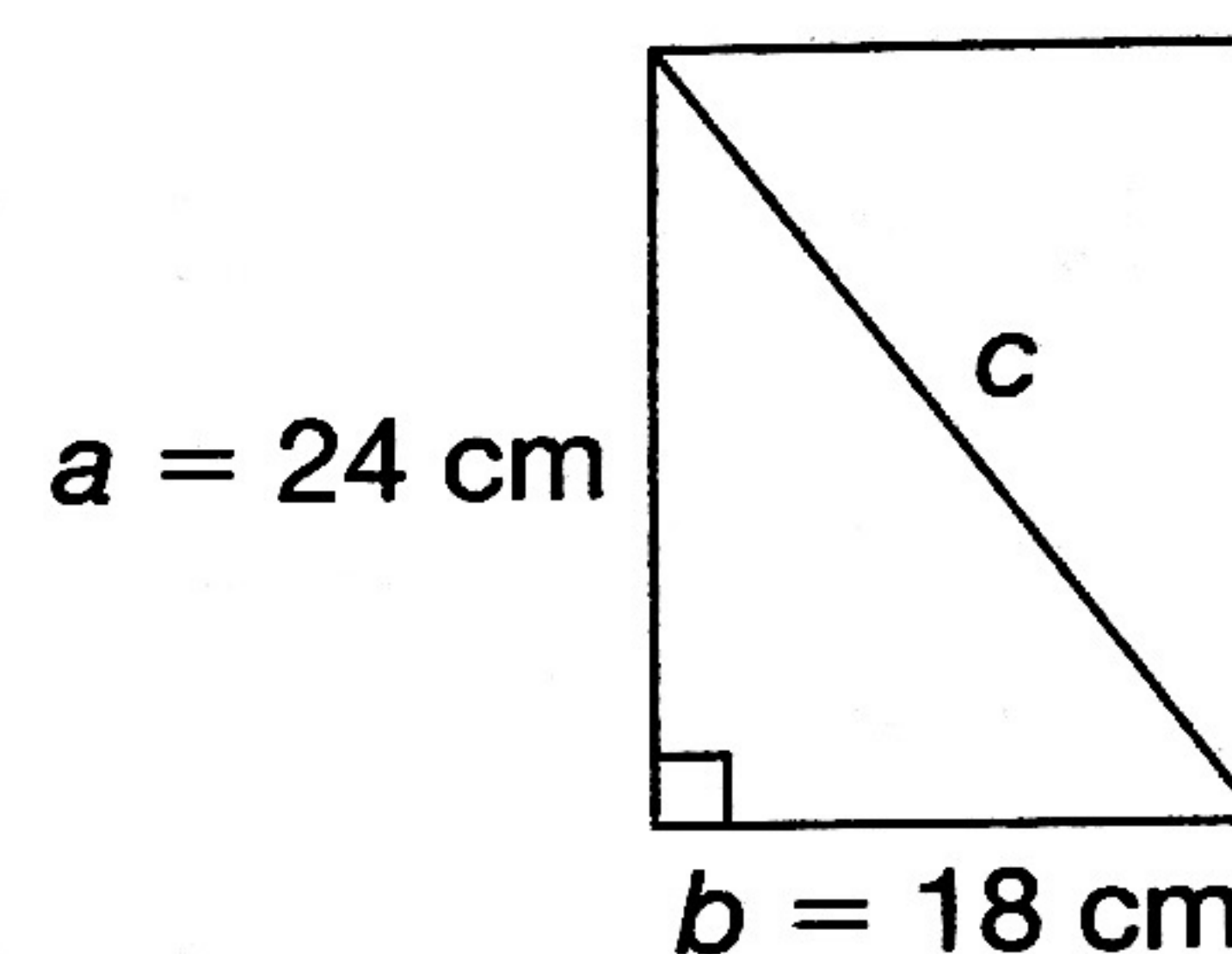
At-Home Help

A piece of wood is 24 cm long and 18 cm wide. Ian wants to cut the wood diagonally to make two shelf supports. What is the length of the diagonal?

When solving word problems in math, the following steps will help you:

1. Understand the problem.

Draw a diagram of the situation.



2. Make a plan.

Use the Pythagorean theorem to calculate the length of the diagonal.

3. Carry out the plan.

$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= 24^2 + 18^2 \\ c^2 &= 576 + 324 \\ c^2 &= 900 \\ \sqrt{c^2} &= \sqrt{900} \\ c &= 30 \text{ cm} \end{aligned}$$

The length of the diagonal for each shelf support is 30 cm.