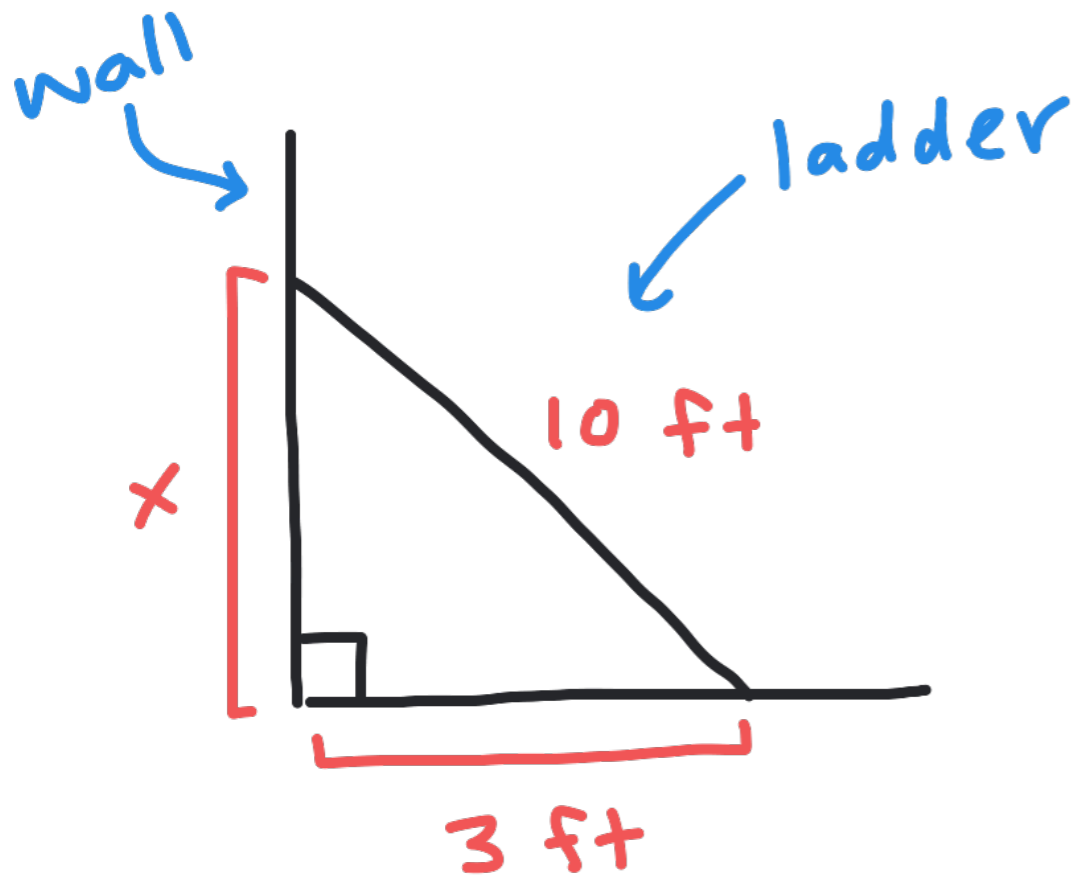


Pythagorean Theorem

Word Problems

1. The bottom of a ladder must be placed 3 feet from a wall. The ladder is 10 feet long. How far above the ground does the ladder touch the wall?



$$x^2 + 3^2 = 10^2$$

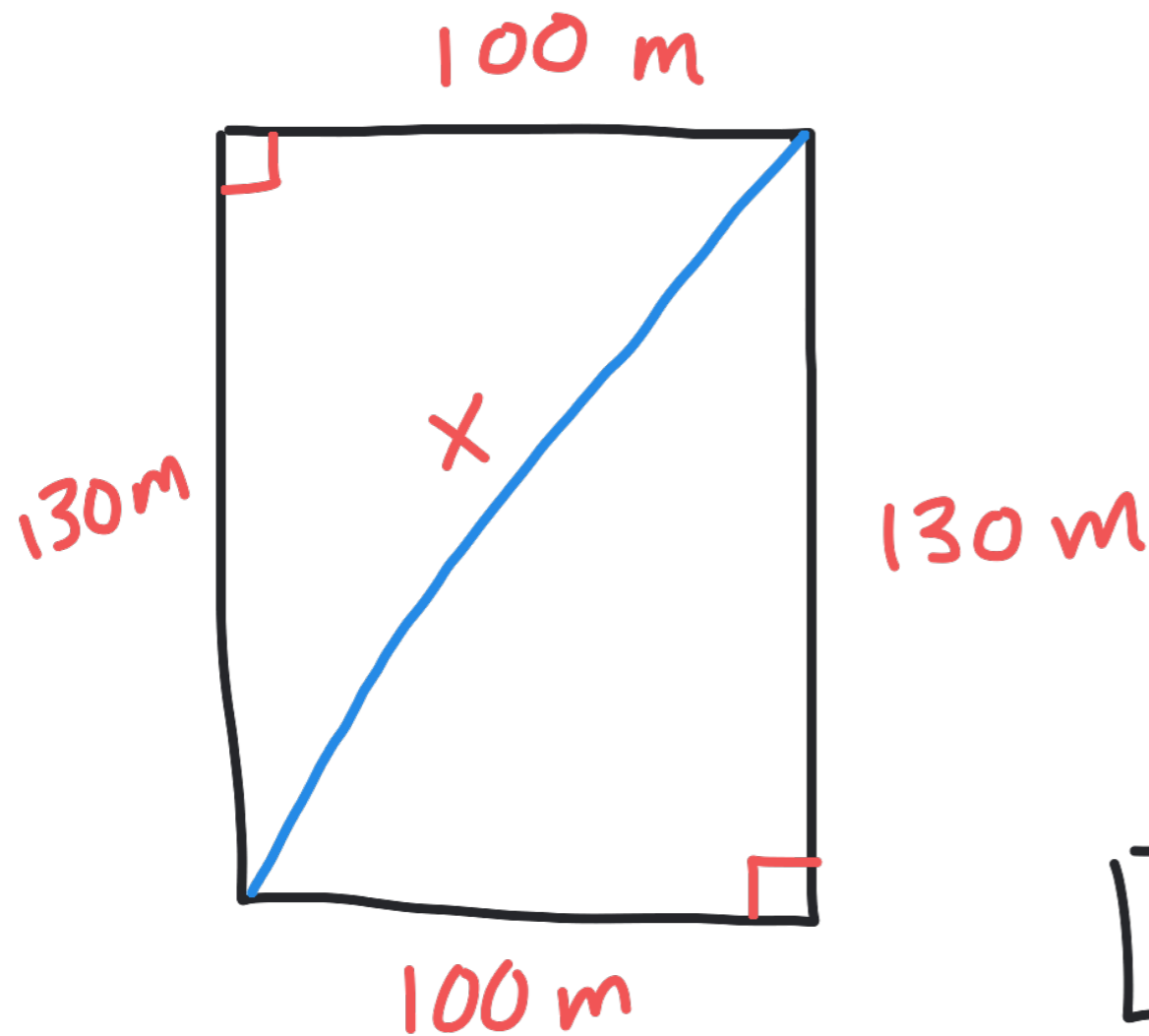
$$x^2 + 9 = 100$$

$$x^2 = 91$$

$$x = \sqrt{91} \approx 9.5$$

$$\boxed{9.5 \text{ ft}}$$

2. A soccer field is a rectangle 100 meters wide and 130 meters long. The coach asks players to run from one corner to the other corner diagonally across. What is that distance?



$$100^2 + 130^2 = x^2$$

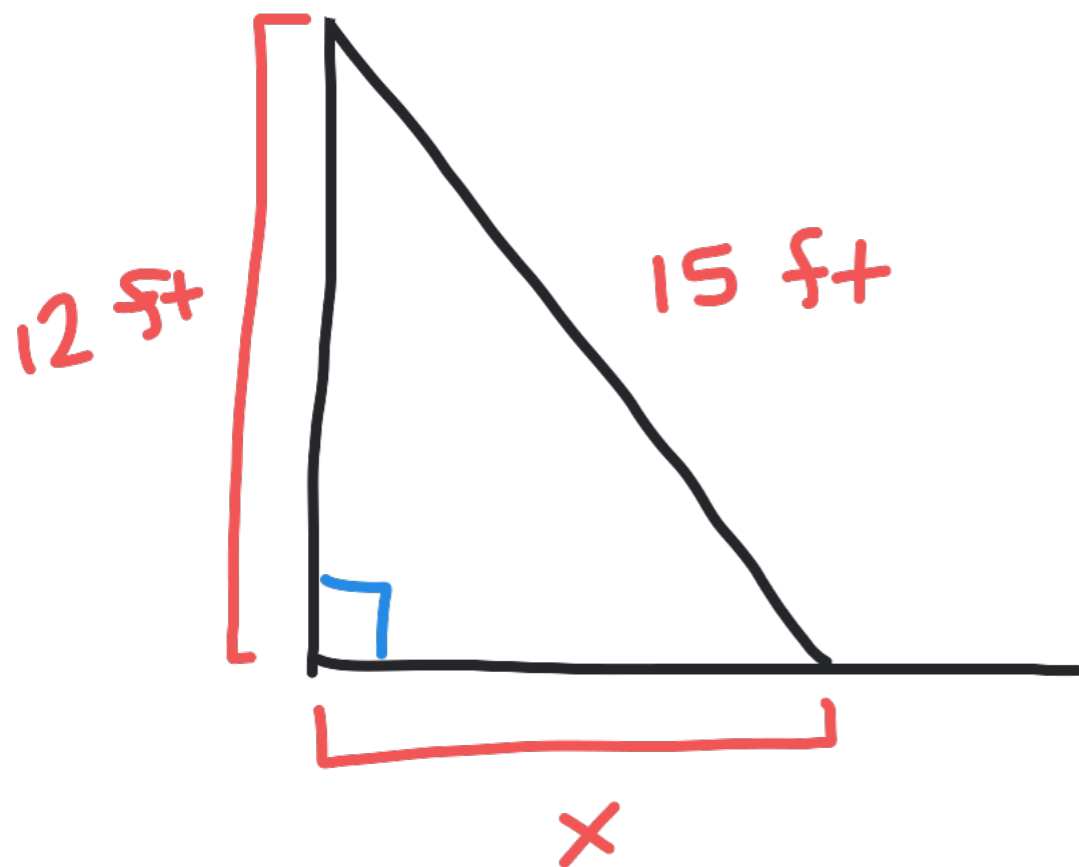
$$10000 + 16900 = x^2$$

$$x^2 = 26900$$

$$x = \sqrt{26900} \approx 164.0$$

$$x = 164.0 \text{ m}$$

3. How far from the base of the house do you need to place a 15-foot ladder so that it exactly reaches the top of a 12-foot tall wall?



$$x^2 + 12^2 = 15^2$$

$$x^2 + 144 = 225$$

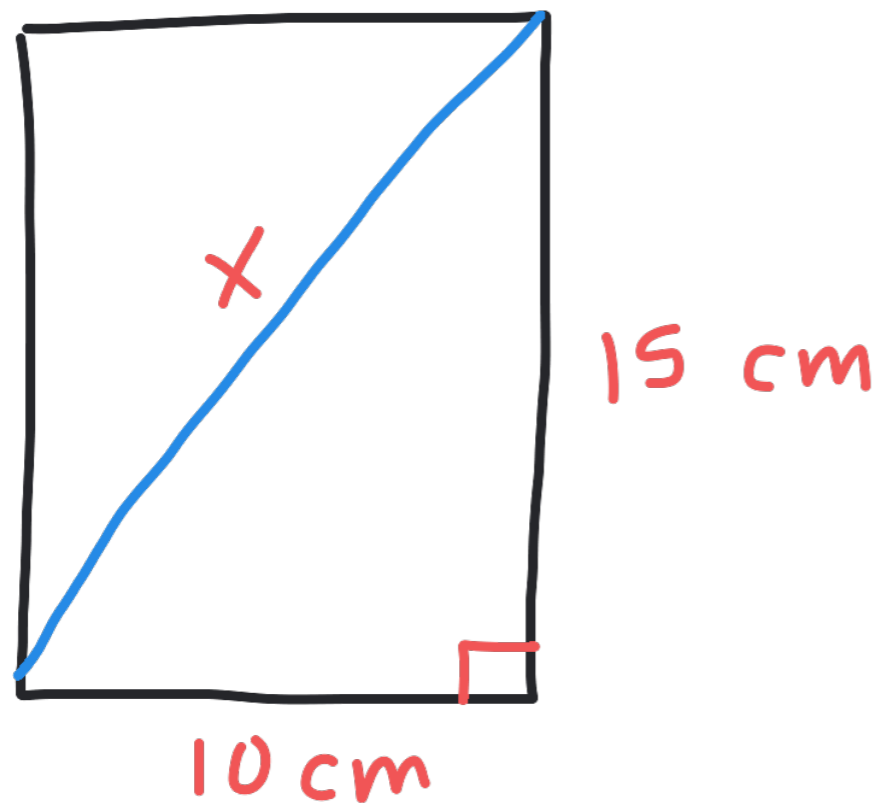
$$x^2 = 81$$

$$x = \sqrt{81}$$

$$x = 9$$

9 ft

4. What is the length of the diagonal of a 10 cm by 15 cm rectangle?



$$15^2 + 10^2 = x^2$$

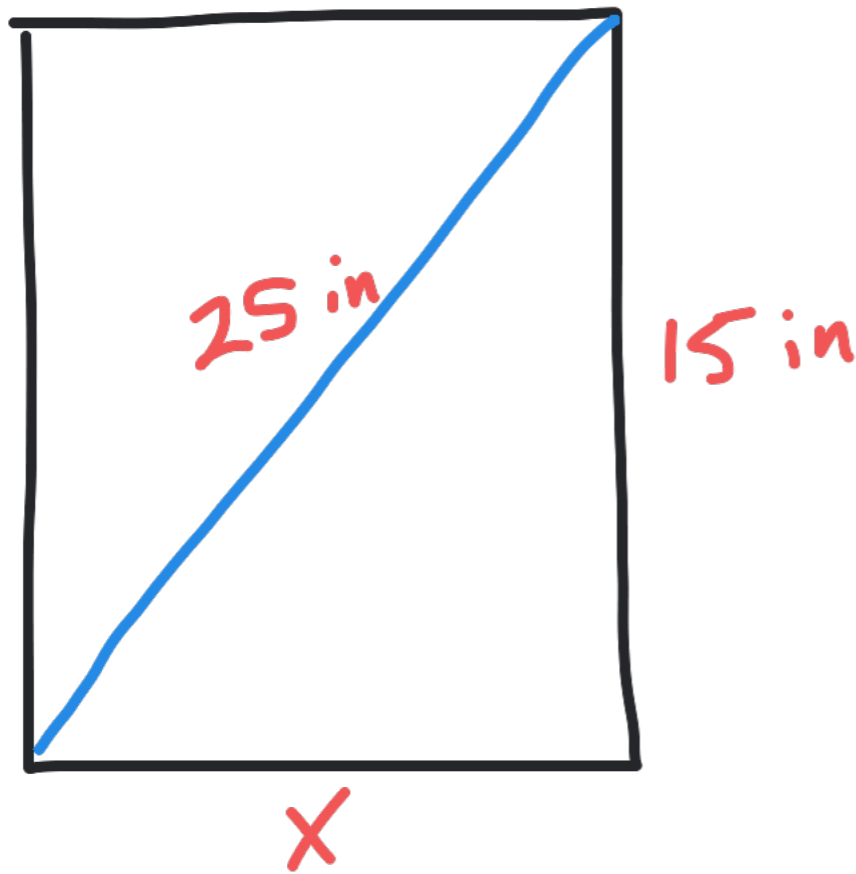
$$225 + 100 = x^2$$

$$x^2 = 325$$

$$x = \sqrt{325} \approx 18.0$$

18.0 cm

5. The diagonal of a rectangle is 25 in. The width is 15 inches. What is the length?



$$15^2 + x^2 = 25^2$$

$$225 + x^2 = 625$$

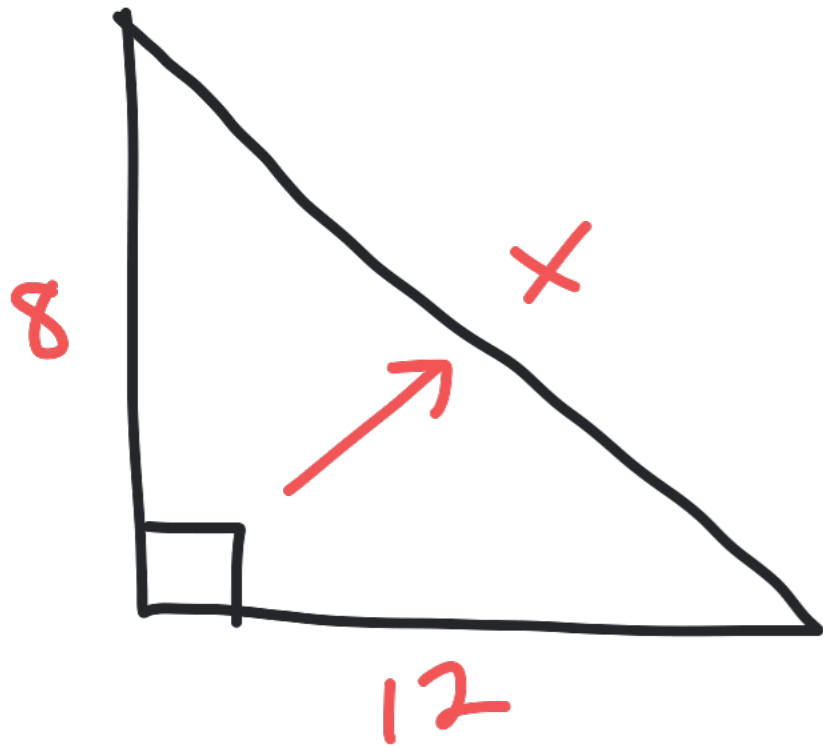
$$x^2 = 400$$

$$x = \sqrt{400}$$

$$x = 20$$

20 in

6. Two sides of a right triangle are 8 and 12. Find the hypotenuse.



$$8^2 + 12^2 = x^2$$

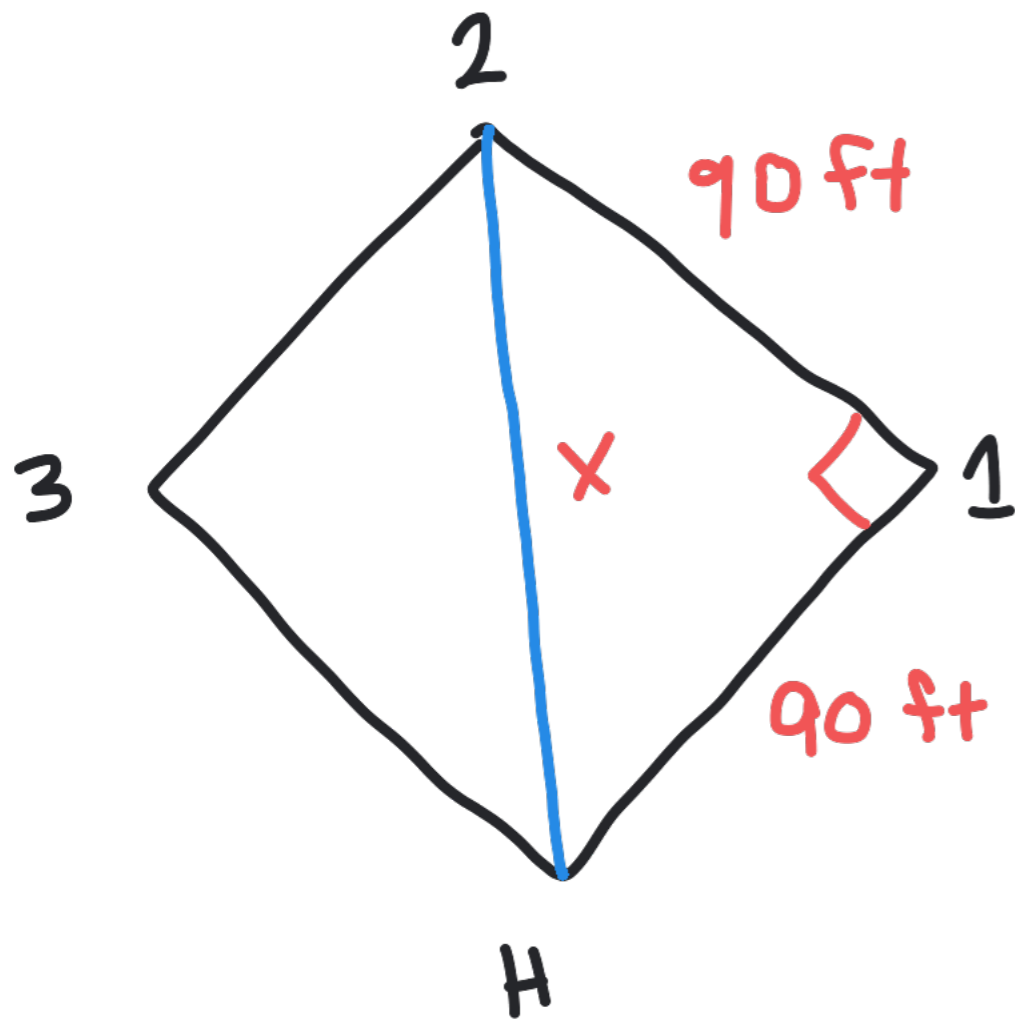
$$x^2 = 64 + 144$$

$$x^2 = 208$$

$$x = \sqrt{208} \approx 14.4$$

$$\boxed{14.4}$$

7. A baseball diamond is a square that is 90 feet on each side. What is the distance a catcher has to throw the ball from home to second base?



$$90^2 + 90^2 = x^2$$

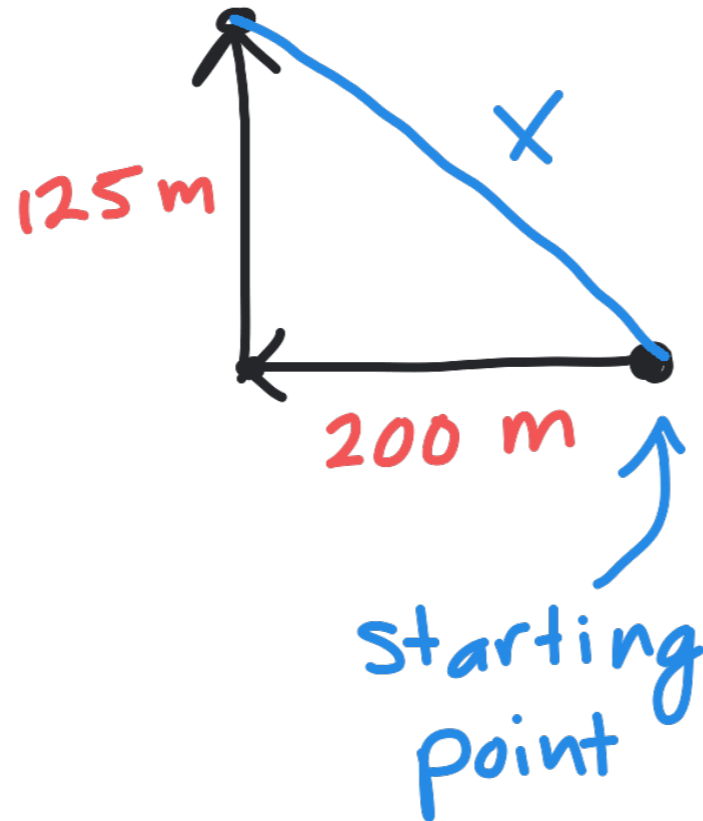
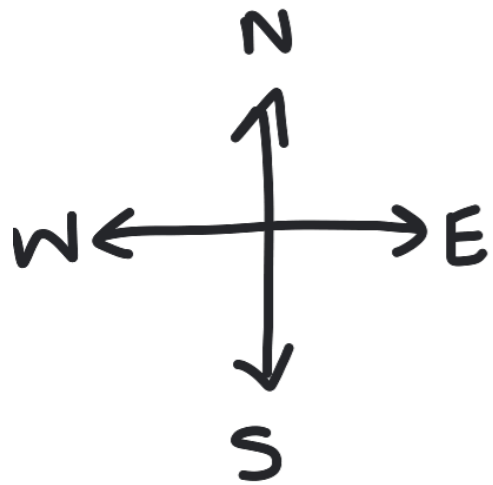
$$x^2 = 8100 + 8100$$

$$x^2 = 16200$$

$$x = \sqrt{16200} \approx 127.3$$

$$\boxed{127.3 \text{ ft}}$$

8. David leaves the house to go to school. He walks 200m west and 125m north. How far away is he from his starting point? (the diagonal)



$$125^2 + 200^2 = x^2$$

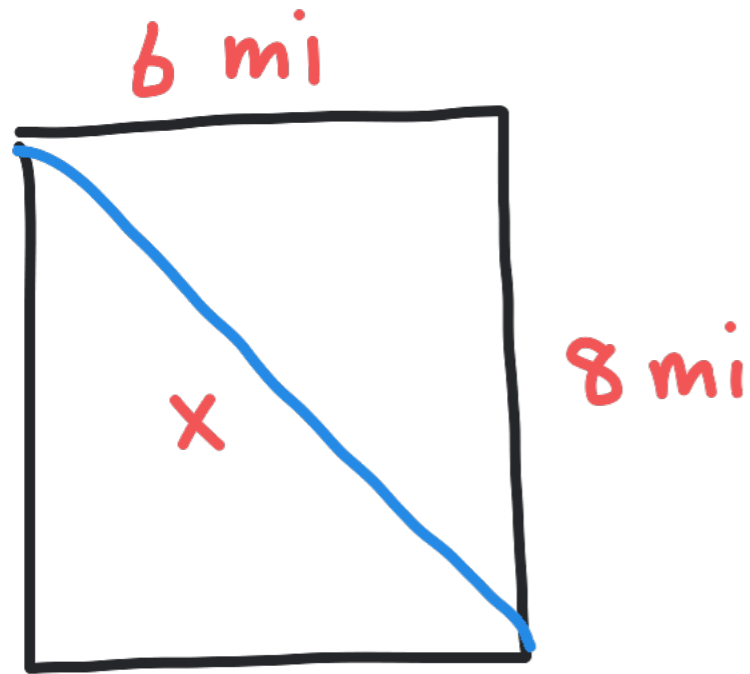
$$x^2 = 15625 + 40000$$

$$x^2 = 55625$$

$$x = \sqrt{55625} \approx 235.8$$

$$235.8 \text{ m}$$

9. A park is in the shape of a rectangle 8 miles long and 6 miles wide. How much shorter is your walk if you walk diagonally across the park than along the two sides of it?



$$6^2 + 8^2 = x^2$$

$$x^2 = 36 + 64$$

$$x^2 = 100$$

$$x = \sqrt{100} = 10 \text{ miles}$$

Walk around sides

$$6 + 8 = 14 \text{ miles}$$

Walk diagonally

10 miles

$$14 - 10 = \boxed{4 \text{ miles shorter}}$$