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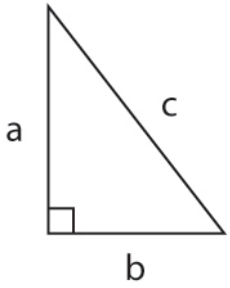
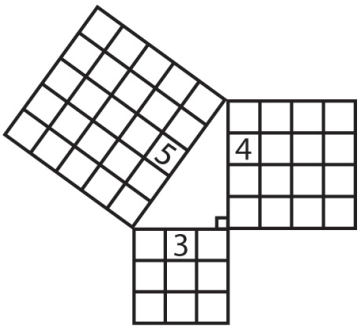
PYTHAGOREAN THEOREM

The Pythagorean Theorem is used to calculate the unknown side of a triangle. In order for this theorem to work, the triangle must have a 90° angle.

The letters 'a' and 'b' correspond to the shorter sides of the triangle, and the letter 'c' corresponds to the longest side of the triangle.





To calculate the length of side 'c', the formula is $a^2 + b^2 = c^2$
To calculate the length of side 'a', the formula is $c^2 - b^2 = a^2$
To calculate the length of side 'b', the formula is $c^2 - a^2 = b^2$

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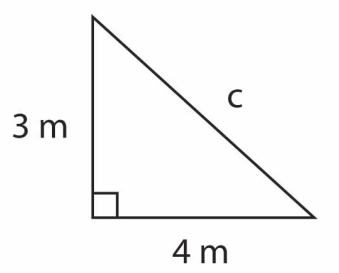
Example 1:

Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.



From the figure, we know that:

- **Side 'a' is 3 m.**
- **Side 'b' is 4 m.**
- **Side 'c' is unknown.**

Substitute the known numbers into the formula:

a2 + b2 = c2

32 + 42 = c2

9 + 16 = c2

25 = c2

$\sqrt{25}$ **= c**

c = 5.00 m

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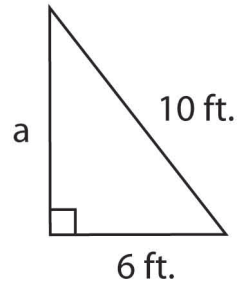
Example 2:

Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.



From the figure, we know that:

- **Side 'a' is unknown.**
- **Side 'b' is 6 ft.**
- **Side 'c' is 10 ft.**

Substitute the known numbers into the formula:

$c^2 - b^2 = a^2$

$10^2 - 6^2 = a^2$

$100 - 36 = a^2$

$\sqrt{64} = a$

a = 8.00 ft.

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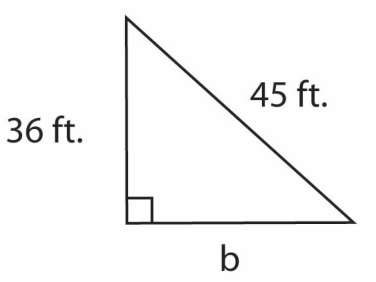
Example 3:

Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.



From the figure, we know that:

- **Side 'a' is 36 ft.**
- **Side 'b' is unknown.**
- **Side 'c' is 45 ft.**

Substitute the known numbers into the formula:

$c^2 - a^2 = b^2$

$45^2 - 36^2 = b^2$

$2025 - 1296 = b^2$

$\sqrt{729} = b$

b = 27.00 ft.

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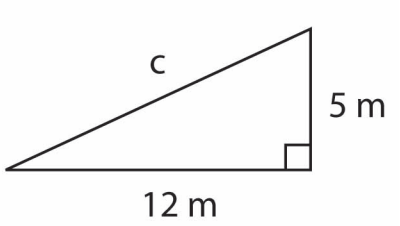
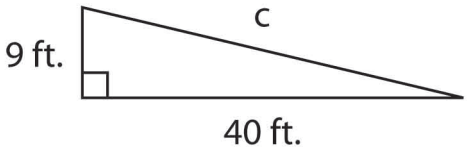
Practice Questions:

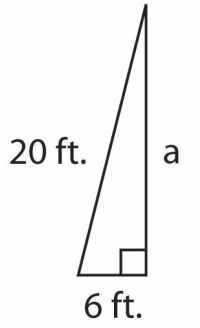
1. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**



2. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**



3. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**



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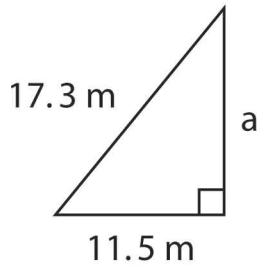
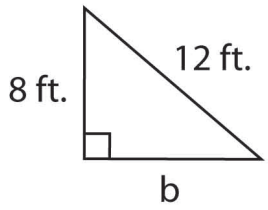
Practice Questions:

4. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**



5. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**



6. **Determine the length of the unknown side of the triangle. Round off the answer to two decimal places.**