

Introduction to Pythagoras' Theorem: Finding the Long Side



Use the diagram and Pythagoras' theorem to find the missing hypotenuse.

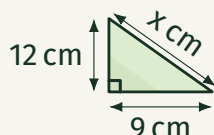
Name _____

Date _____

Show your method

Write the equation using $a^2 + b^2 = c^2$, substitute the two known shorter sides, and solve for the hypotenuse. Round to 1 decimal place if needed.

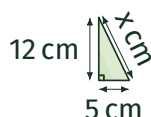
Worked example Find the missing hypotenuse in a right-angled triangle with shorter sides 9 cm and 12 cm.



$$\begin{aligned}\text{Using } a^2 + b^2 &= c^2: \\ 9^2 + 12^2 &= c^2 \\ 81 + 144 &= c^2 \\ 225 &= c^2 \\ c &= 15 \text{ cm}\end{aligned}$$

1. Find the length of x .

Solution: $5^2 + 12^2 = 169$; $x = 13$



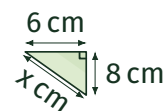
2. Find the length of x .

Solution: $8^2 + 15^2 = 289$; $x = 17$



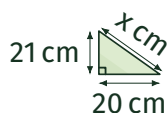
3. Find the length of x .

Solution: $6^2 + 8^2 = 100$; $x = 10$



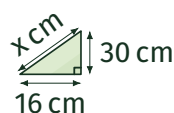
4. Find the length of x .

Solution: $20^2 + 21^2 = 841$; $x = 29$



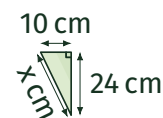
5. Find the length of x .

Solution: $16^2 + 30^2 = 1156$; $x = 34$



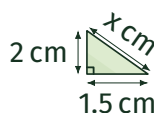
6. Find the length of x .

Solution: $10^2 + 24^2 = 676$; $x = 26$



7. Find the length of x .

Solution: $1.5^2 + 2^2 = 6.25$; $x = 2.5$



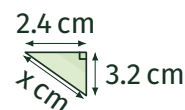
8. Find the length of x .

Solution: $0.9^2 + 1.2^2 = 2.25$; $x = 1.5$



9. Find the length of x .

Solution: $2.4^2 + 3.2^2 = 16$; $x = 4$



Introduction to Pythagoras' Theorem (continued)

Solutions for finding the hypotenuse in various contexts.

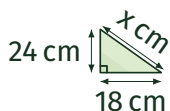


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10. Find the length of x .

Solution: $18^2 + 24^2 = 900$; $x = 30$



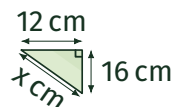
11. Find the length of x .

Solution: $3^2 + 4^2 = 25$; $x = 5$



12. Find the length of x .

Solution: $12^2 + 16^2 = 400$; $x = 20$



13. Shorter sides 6.4 cm, 9.1 cm.

Solution: $40.96 + 82.81 = 123.77$; $x \approx 11.1$ cm

14. Shorter sides 1.1 m, 2.4 m.

Solution: $1.21 + 5.76 = 6.97$; $x \approx 2.6$ m

15. Zip-line: 15 m base, 20 m up tower.

Solution: $225 + 400 = 625$; length = 25 m

16. Field 30 m by 40 m.

Solution: $900 + 1600 = 2500$; diagonal = 50 m

17. Ladder: 5.5 m up, 1.5 m out.

Solution: $30.25 + 2.25 = 32.5$; ladder ≈ 5.7 m

18. Screen 35 cm by 62 cm.

Solution: $1225 + 3844 = 5069$; diagonal ≈ 71 cm