Pythagoras' Theorem: Finding Short and Long Sides

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

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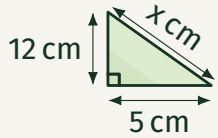
Show your method

Write the equation using $a^2 + b^2 = c^2$, substitute the known lengths, and solve for the missing side. Round to 1 decimal place if needed.

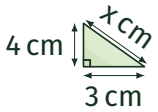
Worked example Find the missing side in a right-angled triangle with legs 5 cm and 12 cm.



Using $a^2 + b^2 = c^2$:
$5^2 + 12^2 = c^2$
$25 + 144 = c^2$
$169 = c^2$
$c = 13$ cm

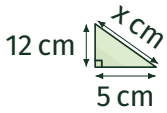
1. Find the length of x.

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



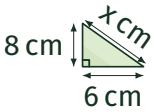
2. Find the length of x.

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



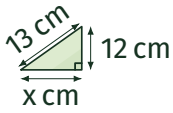
3. Find the length of x.

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



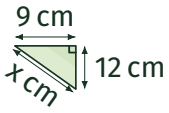
4. Find the length of x.

Solution: $x^2 + 144 = 169$; $x = 5$



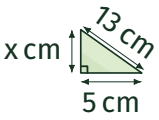
5. Find the length of x.

Solution: $81 + 144 = x^2$; $x = 15$



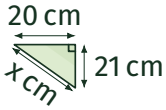
6. Find the length of x.

Solution: $25 + x^2 = 169$; $x = 12$



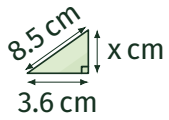
7. Find the length of x.

Solution: $400 + 441 = x^2$; $x = 29$



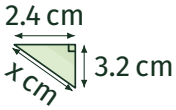
8. Find the length of x.

Solution: $12.96 + x^2 = 72.25$; $x = 7.7$



9. Find the length of x.

Solution: $5.76 + 10.24 = x^2$; $x = 4.0$



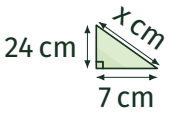
Pythagoras' Theorem (continued)

Solutions for finding missing sides in various contexts.

Name _____ **Date** _____

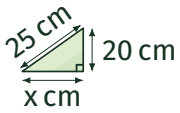
10. Find the length of x.

Solution: $49 + 576 = x^2$; $x = 25$



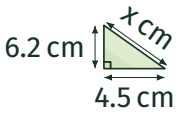
11. Find the length of x.

Solution: $x^2 + 400 = 625$; $x = 15$



12. Find the length of x.

Solution: $20.25 + 38.44 = x^2$; $x = 7.7$



13. Rope 15 m, base 9 m.

Solution: $81 + h^2 = 225$; $h = 12$ m

14. Frame 1.2 m × 0.9 m.

Solution: $1.44 + 0.81 = 2.25$; $d = 1.5$ m

15. Ladder 10 m, 6 m away.

Solution: $36 + h^2 = 100$; $h = 8$ m

16. Legs 8 cm, x cm; hyp 17 cm.

Solution: $64 + x^2 = 289$; $x = 15$ cm

17. Leg 11 m; hyp 60 m.

Solution: $121 + b^2 = 3600$; $b = 59.0$ m

18. Square side 5 cm.

Solution: $25 + 25 = 50$; $d = 7.1$ cm