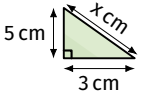
Push Tasks — Answers

Every hypotenuse on this page is a non-perfect-square surd. Leave each answer in simplified surd form, e.g. $\sqrt{50} = 5\sqrt{2}$.

1.



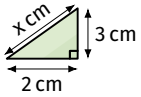
Solution

$x^2 = 3^2 + 5^2$

$= 9 + 25 = 34$

$x = \sqrt{34}$

2.



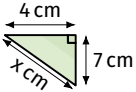
Solution

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

$= 4 + 9 = 13$

$x = \sqrt{13}$

3.



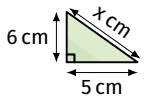
Solution

$x^2 = 4^2 + 7^2$

$= 16 + 49 = 65$

$x = \sqrt{65}$

4.



Solution

$x^2 = 5^2 + 6^2$

$= 25 + 36 = 61$

$x = \sqrt{61}$

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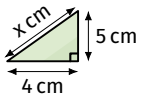
5.



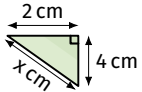
Solution

$x^2 = 4^2 + 5^2$

$= 16 + 25 = 41$

$x = \sqrt{41}$

6.



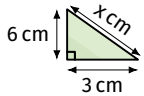
Solution

$x^2 = 2^2 + 4^2$

$= 4 + 16 = 20$

$x = \sqrt{20} = 2\sqrt{5}$

7.



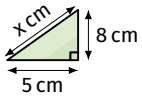
Solution

$x^2 = 3^2 + 6^2$

$= 9 + 36 = 45$

$x = \sqrt{45} = 3\sqrt{5}$

8.



Solution

$x^2 = 5^2 + 8^2$

$= 25 + 64 = 89$

$x = \sqrt{89}$

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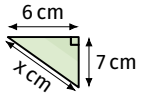
9.



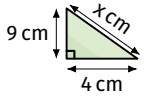
Solution

$x^2 = 6^2 + 7^2$

$= 36 + 49 = 85$

$x = \sqrt{85}$

10.



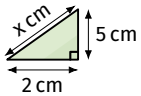
Solution

$x^2 = 4^2 + 9^2$

$= 16 + 81 = 97$

$x = \sqrt{97}$

11.



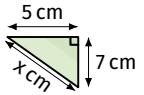
Solution

$x^2 = 2^2 + 5^2$

$= 4 + 25 = 29$

$x = \sqrt{29}$

12.



Solution

$x^2 = 5^2 + 7^2$

$= 25 + 49 = 74$

$x = \sqrt{74}$

Push Tasks — Answers

Leave each numeric answer as a simplified surd. Question 16 asks you to explain, not calculate.

13. A rectangular gate is 2 m high and 7 m wide. Find the length of a diagonal brace fitted corner to corner, as a simplified surd.

Solution

$c^2 = 2^2 + 7^2 = 4 + 49 = 53$, so brace $= \sqrt{53}$ m

14. A rectangle measures 3 m by 9 m. Find the length of its diagonal, as a simplified surd.

Solution

$c^2 = 3^2 + 9^2 = 9 + 81 = 90$, so diagonal $= \sqrt{90} = 3\sqrt{10}$ m

15. Two hikers start at the same point. One walks 6 km due north, the other walks 11 km due east. Find the straight-line distance between them, as a simplified surd.

Solution

$c^2 = 6^2 + 11^2 = 36 + 121 = 157$, so distance $= \sqrt{157}$ km

16. Explain why the diagonal of a square with side length s can always be written as $s\sqrt{2}$.

Solution

Both legs equal s, so $c^2 = s^2 + s^2 = 2s^2$, giving $c = \sqrt{2s^2} = s\sqrt{2}$.