

Grade 8 - The Pythagorean Theorem - Answer Key

Common Core 8.G.B.6, 8.G.B.7 · maths-pdf.fr/en/

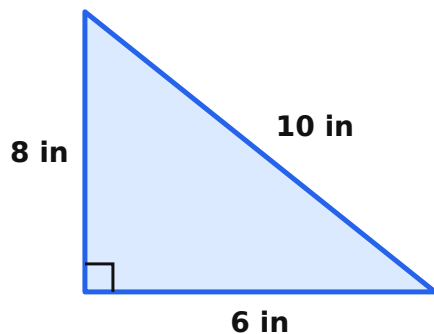
This answer key gives a full worked solution for each of the 20 problems on the the Pythagorean theorem worksheet (Common Core 8.G.B.6 and 8.G.B.7). Compare each step with your own work, not only the final answer, and note any step where your method differed.

Grade 8 · Common Core State Standards: **8.G.B.6, 8.G.B.7**

Exercise 1 - Find the hypotenuse

$$6^2 + 8^2 = 36 + 64 = 100.$$

$$c = \sqrt{100} = 10.$$



A right triangle.

10 inches

Exercise 2 - Another triple

$$25 + 144 = 169, \text{ so } c = 13.$$

13

Exercise 3 - Find a leg

$$8^2 + b^2 = 17^2, \text{ so } b^2 = 289 - 64 = 225.$$

15

Exercise 4 - Not a whole number

$$49 + 81 = 130.$$

$$\sqrt{130} \approx 11.4, \text{ because } 11.4^2 = 129.96.$$

about 11.4

Exercise 5 - Is it a right triangle?

$$9^2 + 12^2 = 81 + 144 = 225 = 15^2.$$

Yes

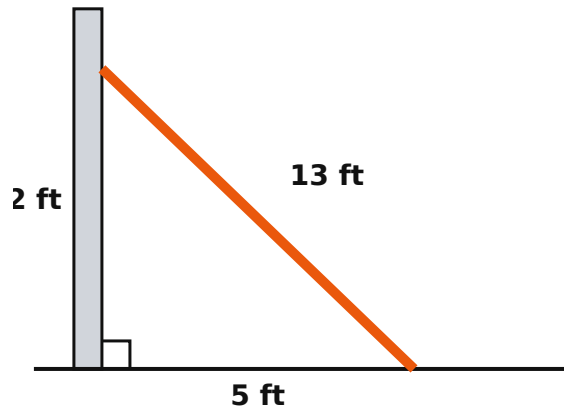
Exercise 6 - Not a right triangle

$$7^2 + 8^2 = 113, \text{ but } 12^2 = 144.$$

No

Exercise 7 - Ladder

$$5^2 + h^2 = 13^2, \text{ so } h^2 = 144.$$



The ladder reaches 12 ft.

12 feet

Exercise 8 - Rectangle diagonal

$$12^2 + 9^2 = 144 + 81 = 225.$$

15 feet

Exercise 9 - TV screen

$$40^2 + 24^2 = 1600 + 576 = 2176.$$

$$\sqrt{2176} \approx 46.6.$$

about 46.6 inches

Exercise 10 - Isosceles right triangle

$$10^2 + 10^2 = 200, \text{ so } c = \sqrt{200} \approx 14.1.$$

about 14.1

Exercise 11 - Perimeter

$$\text{Hypotenuse: } \sqrt{81 + 144} = 15.$$

$$\text{Perimeter: } 9 + 12 + 15 = 36.$$

Exercise 12 - Test the converse

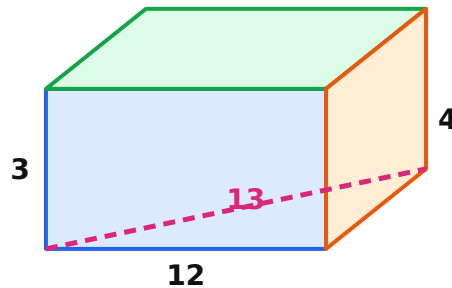
$$20^2 + 21^2 = 400 + 441 = 841 \text{ and } 29^2 = 841.$$

Yes, it is a right triangle

Exercise 13 - 3D box

$$\text{Floor diagonal: } \sqrt{12^2 + 4^2} = \sqrt{160}.$$

$$\text{Space diagonal: } \sqrt{160 + 9} = \sqrt{169} = 13.$$



The space diagonal is 13.

13

Exercise 14 - Smaller box

$$2^2 + 3^2 + 6^2 = 4 + 9 + 36 = 49.$$

7

Exercise 15 - Baseball diamond

The diagonal splits the square into right triangles: $90^2 + 90^2 = 16,200$.

$$\sqrt{16200} \approx 127.3.$$

about 127.3 feet

Exercise 16 - Ramp

$$12^2 + 5^2 = 169.$$

13 feet

Exercise 17 - Kite string

$$30^2 + 40^2 = 2500.$$

50 feet

Exercise 18 - Shortcut

Direct path: $\sqrt{25+144}=13$ miles.

Walked: $5+12=17$ miles. Saved: $17-13=4$.

4 miles

Exercise 19 - Phone screen

$$2.5^2 + 5.5^2 = 6.25 + 30.25 = 36.5.$$

$$\sqrt{36.5} \approx 6.0.$$

about 6.0 inches

Exercise 20 - Explain

Take sides 3, 4 and 6: $3^2 + 4^2 = 25$, but $6^2 = 36$. The triangle has no right angle.

The theorem works only for right triangles