

Grade 8 · The Pythagorean Theorem · Quiz

Common Core 8.G.B.6, 8.G.B.7 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

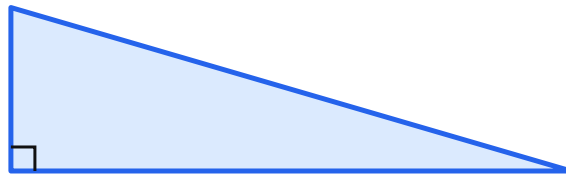
Ten multiple-choice questions on the Pythagorean Theorem (8.G.B.6 and 8.G.B.7). Find missing sides, test triangles with the converse, and handle ladders, screens and boxes. Pick the single best answer, then read the explanation to see which mistake each wrong choice matches.

Grade 8 Common Core: 8.G.B.6 · 8.G.B.7

Questions

Question 1

What is the length of the hypotenuse?



A right triangle with legs 7 and 24.

- A. 31
- B. 17
- C. 25
- D. 625

Question 2

A right triangle has a hypotenuse of 20 and one leg of 12. What is the other leg?

- A. 8
- B. 16
- C. 23.3
- D. 32

Question 3

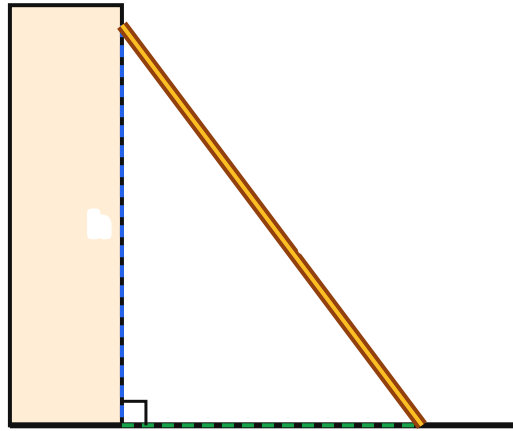
Which set of side lengths forms a right triangle?

- A. 8, 12, 15
- B. 9, 40, 41

- C. 6, 9, 11
- D. 10, 15, 18

Question 4

A 10-ft ladder has its base 6 ft from a wall. How high up the wall does it reach?



A ladder leaning on a wall.

- A. 4 ft
- B. 11.7 ft
- C. 64 ft
- D. 8 ft

Question 5

A TV screen is 16 in. wide and 12 in. tall. How long is the diagonal?

- A. 28 in
- B. 4 in
- C. 20 in
- D. 400 in

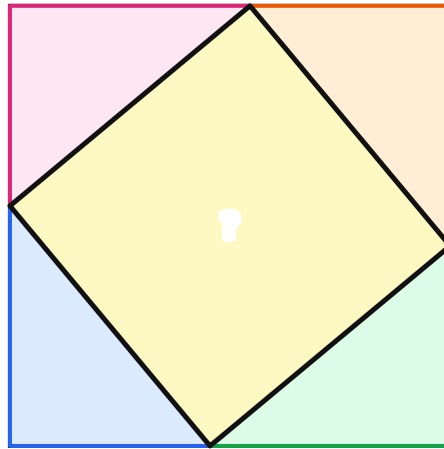
Question 6

The legs of a right triangle are 3 and 5. What is the hypotenuse to the nearest tenth?

- A. 8.0
- B. 5.8
- C. 4.0
- D. 34.0

Question 7

A square with side 11 contains four right triangles with legs 5 and 6. What is the area of the tilted square in the middle?

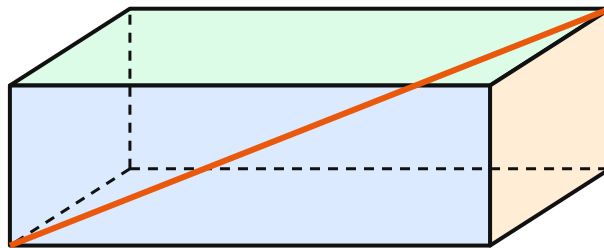


Four triangles with legs 5 and 6.

- A. 91
- B. 121
- C. 60
- D. 61

Question 8

What is the length of the space diagonal of a box that is 2 by 3 by 6?



A box.

- A. 7
- B. 11
- C. 49
- D. 3.6

Question 9

A triangle has sides 6 in., 8 in. and 9 in. Which statement is correct?

- A. It is a right triangle, because $6 + 8$ is greater than 9.
- B. It is a right triangle, because 9 is its longest side.
- C. It is not a right triangle, because $6^2 + 8^2$ is 100, not 81.

D. It is a right triangle, because all three sides are whole numbers.

Question 10

Liam walks 0.6 mi west and then 0.8 mi south. How far is he from his start in a straight line?

- A. 1.0 mi
- B. 1.4 mi
- C. 0.2 mi
- D. 0.5 mi

Answer key

1. **C** - $7^2 + 24^2 = 49 + 576 = 625$, and $\sqrt{625} = 25$. Adding the legs gives 31, and stopping at 625 forgets the square root.
2. **B** - $b^2 = 20^2 - 12^2 = 400 - 144 = 256$, so $b = 16$. Subtracting the sides gives 8, and adding the squares gives about 23.3.
3. **B** - $9^2 + 40^2 = 81 + 1600 = 1681 = 41^2$. The other sets come close but fail: for example $10^2 + 15^2 = 325$, not $18^2 = 324$.
4. **D** - $h^2 = 10^2 - 6^2 = 64$, so $h = 8$. Subtracting 10 - 6 gives 4, and adding the squares gives about 11.7.
5. **C** - $16^2 + 12^2 = 256 + 144 = 400$, so the diagonal is 20 in. Adding 16 + 12 gives 28, and 400 is the square of the diagonal.
6. **B** - $3^2 + 5^2 = 34$ and $\sqrt{34} \approx 5.8$. Adding the legs gives 8, and forgetting the square root gives 34.
7. **D** - The triangles cover $4 \cdot \frac{1}{2} \cdot 5 \cdot 6 = 60$, and $121 - 60 = 61$. Subtracting only two triangles gives 91.
8. **A** - $d^2 = 2^2 + 3^2 + 6^2 = 4 + 9 + 36 = 49$, so $d = 7$. Adding the edges gives 11, and 49 is d^2 .
9. **C** - A right triangle needs $a^2 + b^2 = c^2$. Here $36 + 64 = 100$, which is not 81, so there is no right angle.
10. **A** - $0.6^2 + 0.8^2 = 0.36 + 0.64 = 1.00$, so the distance is 1.0 mi. Adding the legs gives 1.4, and subtracting gives 0.2.

Remember:

- Standards 8.G.B.6 and 8.G.B.7: explain a proof of the theorem and its converse, then apply it in two and three dimensions.
- The hypotenuse is opposite the right angle and is always the longest side.
- To find a missing side, substitute into $a^2 + b^2 = c^2$, then take a positive square root.
- Converse: if $a^2 + b^2 = c^2$ holds for the sides of a triangle, it is a right triangle.
- The diagonal of a box satisfies $d^2 = l^2 + w^2 + h^2$.