

USING PYTHAGORAS

Today's goal: I can apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions and apply the Pythagorean Theorem to find the distance between two points in a coordinate system.



Tan



Digit



Blaze



Pi

Name the hypotenuse FIRST

- 1 It is opposite the right angle. It is the longest side.
- 2 Everything after depends on knowing which side it is.

TURN & TALK

Label it before you write anything down.



Hypotenuse missing? ADD

1 Legs 3 and 4. $9 + 16 = 25$. $c = 5$.



BIG IDEA 2

Leg missing? SUBTRACT

1 Hypotenuse 13, leg 5.

2 $169 - 25 = 144$. Leg = 12.

REMEMBER

Not add. The hypotenuse is already the biggest – you are taking a piece off it.



BIG IDEA 3

The error that announces itself

1 Add by mistake: $169 + 25 = 194$, so 13.9.

2 But the hypotenuse is 13.

REMEMBER

A leg longer than the hypotenuse is impossible. You can catch this without the answer.



BIG IDEA 4

Then finish the job

- 1 144 is c^2 , not c .
- 2 Write " $\text{leg}^2 = 144$ ", then take the root.

REMEMBER

The square root is a step, not a formality.



BIG IDEA 5

Distance between two points

- 1 $(1,2)$ to $(5,5)$. Sketch the right triangle.
- 2 Legs are the DIFFERENCES: 4 across, 3 up.
Distance 5.

REMEMBER

Not the coordinates. The gaps between them.



Remember

- 1 Hypotenuse missing $\Rightarrow$ add.
- 2 Leg missing $\Rightarrow$ subtract.
- 3 Then take the square root.



YOUR TURN

Whiteboards up!

Pick your pepper!



🌶️ MILD

Legs 9 and 12. Find the hypotenuse.

#1 on your practice sheet



🌶️🌶️ MEDIUM

Hypotenuse 17, one leg 8.
Find the other leg.

#2 on your practice sheet



🌶️🌶️🌶️ SPICY

Legs 2 and 3. Give the hypotenuse squared, and say why that is the exact answer.

#7 on your practice sheet



How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Watch “The Pythagorean Theorem Explained ($a^2 + b^2 = c^2$)” on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

