

MYSTERY PICTURE

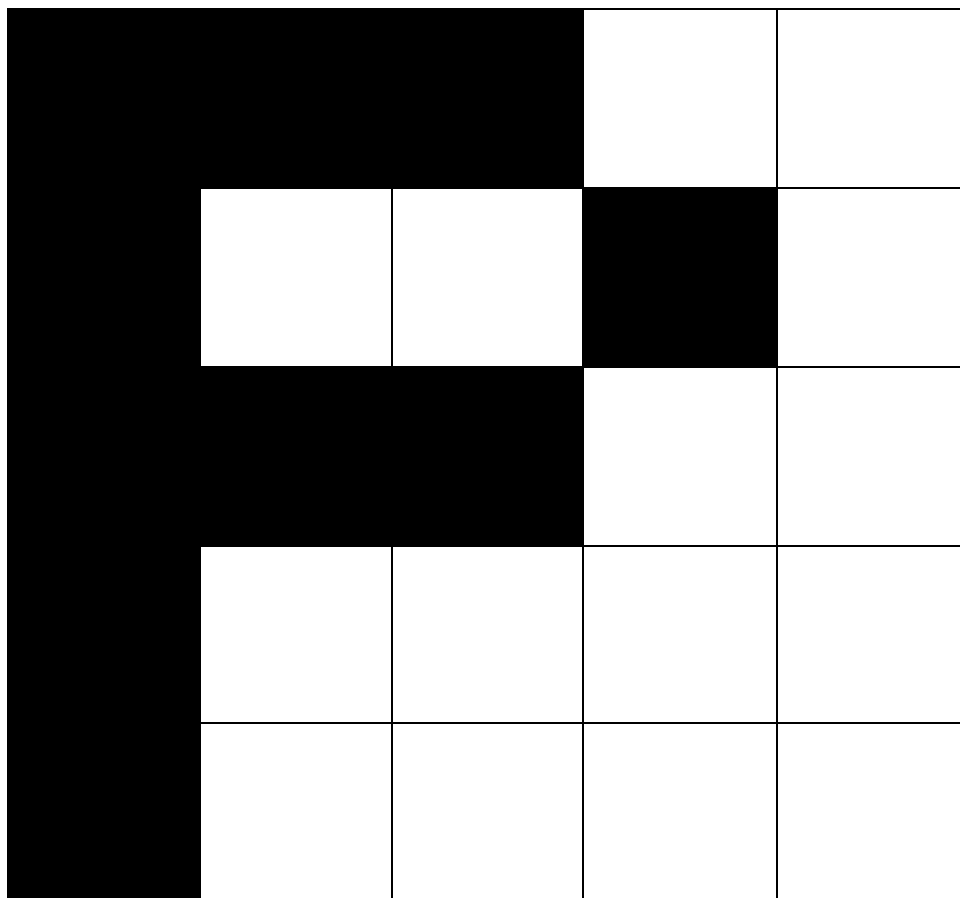


SIDE-ANGLE RELATIONSHIPS IN A TRIANGLE

Can You Trust the Drawing?

25 triangles · longest side? largest angle?

FREE



1. **Hand out page 3**, one per student. Pencils. No rulers or protractors.
2. **Say this once:** *“The drawings are not to scale. Use only the numbers. The longest side is across from the largest angle. The largest angle is across from the longest side.”*
3. **When a student finishes, look at the picture.** If it is not the letter P, a square is wrong. The student finds it and checks it again.

Student sheet	page 3, one per student. At the top it shows, as two small drawings, which side is opposite an angle, and that the largest angle is opposite the longest side.
Answers	page 4: the finished picture and the reason for every square.

This sheet practices one rule in both directions. In a triangle, the longest side is opposite the largest angle, and the largest angle is opposite the longest side. “Opposite” means the side does not touch the angle’s corner. Thirteen squares print three angles and put a question mark on a side: is that side the longest? The other twelve print three sides and put a question mark in an angle: is that angle the largest? The two kinds are mixed, so students must check each time which numbers they were given.

Eleven of the drawings are drawn against their own numbers on purpose. For example, in square 3 the side opposite a 105° angle is drawn as the shortest side. This is the lesson’s warning: a figure that is not drawn to scale tells you nothing about which side is longer. The student sheet says so at the top. A student who trusts the drawing gets eleven squares wrong, and the picture shows it. If that happens, ask: “What do the numbers say?”

The other common mistake is choosing a side that touches the largest angle. Fifteen white squares put the question mark on such a side, or in an angle at one end of the longest side. Ask the student to put a finger on the angle and slide it across the triangle to the side it does not touch.

Ten squares are filled and fifteen are white. Guessing does not work. Every simple guessing rule, such as filling every square with a question mark on a side, gets at least nine squares wrong.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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Mystery Picture

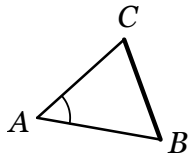
Longest side? Largest angle?

Name _____

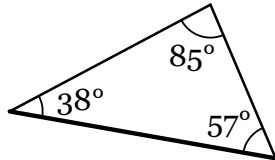
Period _____

Date _____

Each square shows a triangle with a ? on one side or in one angle. ? on a side: is it the longest side? ? in an angle: is it the largest angle? If yes, fill the square with slanted lines. If no, leave it white.



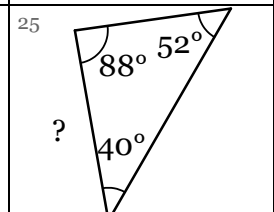
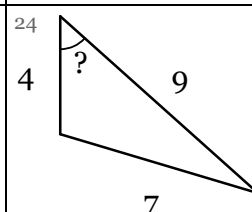
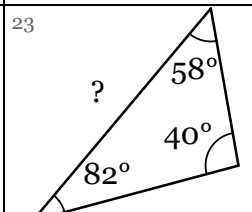
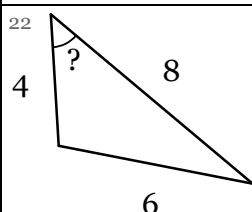
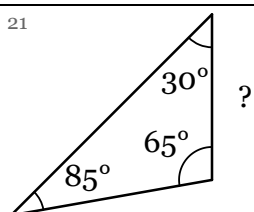
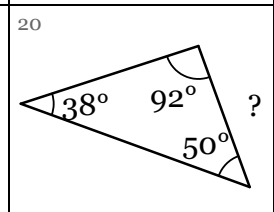
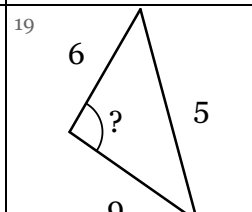
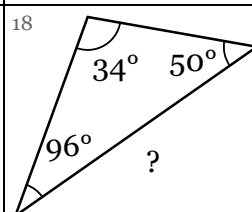
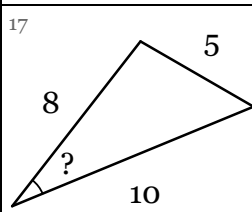
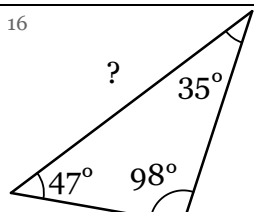
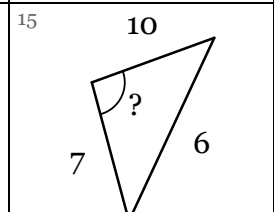
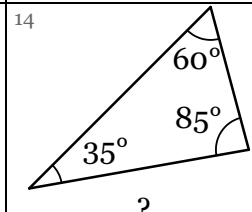
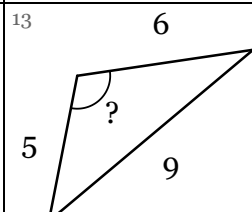
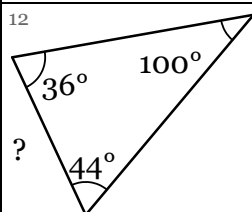
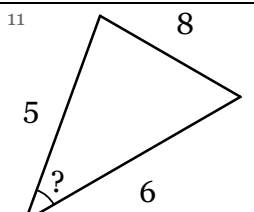
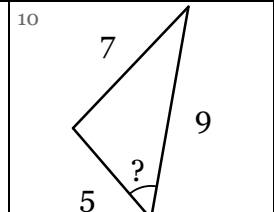
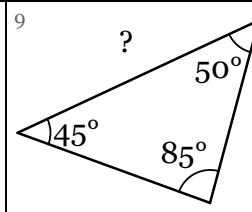
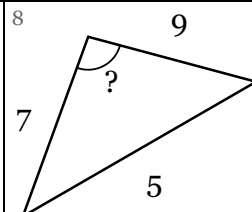
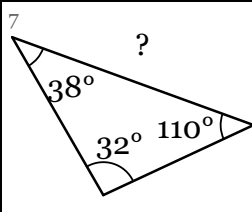
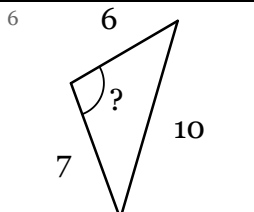
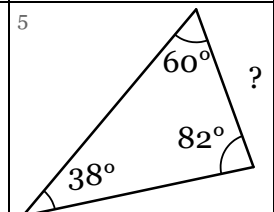
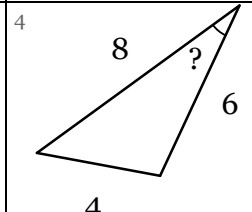
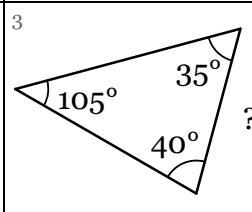
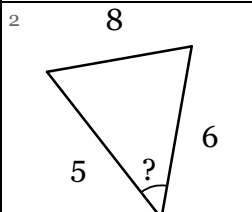
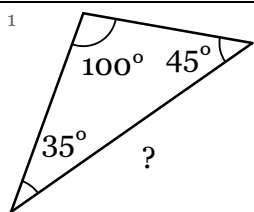
The side **opposite** $\angle A$ is BC. It does not touch A.



The **largest** angle is opposite the **longest** side.

The drawings are NOT drawn to scale. A side can look long and still be the shortest. Use only the printed numbers. Do not measure.

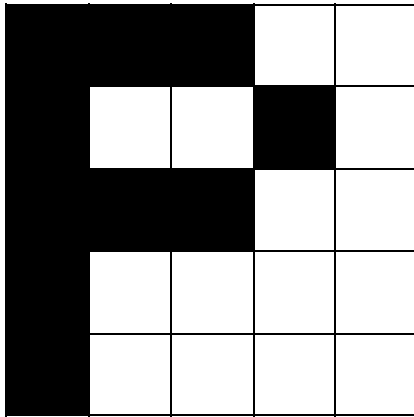
When you finish, look at the picture. If part of it is missing, or one square does not fit, check that square again.



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Mystery Picture — answers

For the teacher



The finished picture is **the letter P**: a line down the left side, with a loop at the top.

A square is filled when the question mark is across from the biggest number. A side across from the largest angle is the longest side. An angle across from the longest side is the largest angle. The drawings do not count, because they are not drawn to scale.

To check a square with a student, put a finger on the question mark and slide it straight across the triangle. Ask: “Which number is on the other side? Is it the biggest?”

1 · FILL

The ? side is across from 100° , the largest angle, so it is the longest side.

2 · FILL

The ? angle is across from the side of 8, the longest side, so it is the largest angle. In the drawing it does not look the largest. But the drawing is not to scale, so it does not count.

3 · FILL

The ? side is across from 105° , the largest angle, so it is the longest side. In the drawing it does not look the longest. But the drawing is not to scale, so it does not count.

4 · white

The ? angle is across from the side of 4, not from the longest side (8), so it is not the largest angle.

5 · white

The ? side is across from 38° , not from the largest angle (82°), so it is not the longest side.

6 · FILL

The ? angle is across from the side of 10, the longest side, so it is the largest angle.

7 · white

The ? side is across from 32° , not from the largest angle (110°), so it is not the longest side. In the drawing it looks the longest. But the drawing is not to scale, so it does not count.

8 · white

The ? angle is across from the side of 5, not from the longest side (9), so it is not the largest angle. In the drawing it looks the largest. But the drawing is not to scale, so it does not count.

9 · FILL

The ? side is across from 85° , the largest angle, so it is the longest side.

10 · white

The ? angle is across from the side of 7, not from the longest side (9), so it is not the largest angle.

11 · FILL

The ? angle is across from the side of 8, the longest side, so it is the largest angle. In the drawing it does not look the largest. But the drawing is not to scale, so it does not count.

12 · FILL

The ? side is across from 100° , the largest angle, so it is the longest side. In the drawing it does not look the longest. But the drawing is not to scale, so it does not count.

13 · FILL

The ? angle is across from the side of 9, the longest side, so it is the largest angle.

14 · white

The ? side is across from 60° , not from the largest angle (85°), so it is not the longest side.

15 · white

The ? angle is across from the side of 6, not from the longest side (10), so it is not the largest angle. In the drawing it looks the largest. But the drawing is not to scale, so it does not count.

16 · FILL

The ? side is across from 98° , the largest angle, so it is the longest side.

17 · white

The ? angle is across from the side of 5, not from the longest side (10), so it is not the largest angle.

18 · white

The ? side is across from 34° , not from the largest angle (96°), so it is not the longest side. In the drawing it looks the longest. But the drawing is not to scale, so it does not count.

19 · white

The ? angle is across from the side of 5, not from the longest side (9), so it is not the largest angle. In the drawing it looks the largest. But the drawing is not to scale, so it does not count.

20 · white

The ? side is across from 38° , not from the largest angle (92°), so it is not the longest side.

21 · FILL

The ? side is across from 85° , the largest angle, so it is the longest side. In the drawing it does not look the longest. But the drawing is not to scale, so it does not count.

22 · white

The ? angle is across from the side of 6, not from the longest side (8), so it is not the largest angle.

23 · white

The ? side is across from 40° , not from the largest angle (82°), so it is not the longest side. In the drawing it looks the longest. But the drawing is not to scale, so it does not count.

24 · white

The ? angle is across from the side of 7, not from the longest side (9), so it is not the largest angle.

25 · white

The ? side is across from 52° , not from the largest angle (88°), so it is not the longest side.