

Grade 8 · The Pythagorean Theorem · Worksheet

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

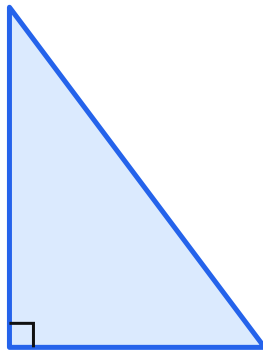
Name: _____ Date: ____/____/____ Score: _____

These 23 problems practice Common Core standards 8.G.B.6 and 8.G.B.7. Start with hypotenuses and missing legs, then explain the proof with areas, use the converse to test triangles, and finish with ladders, TV screens, ball fields and boxes in two and three dimensions. Show each step and round only at the end.

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

Problem 1: Hypotenuse of a 6-8 triangle

Find the length of the hypotenuse.



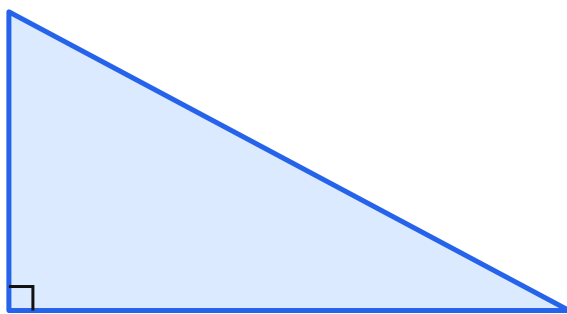
Legs of 6 in and 8 in.

Problem 2: Hypotenuse of a 5-12 triangle

A right triangle has legs of 5 ft and 12 ft. Find the hypotenuse.

Problem 3: Find the missing leg

Find the missing leg.



Hypotenuse 17 yd, one leg 8 yd.

Problem 4: Missing leg of a 7-25 triangle

The hypotenuse of a right triangle is 25 in. One leg is 7 in. Find the other leg.

Problem 5: Legs 9 and 12

Find the hypotenuse of a right triangle with legs 9 in and 12 in.

Problem 6: Hypotenuse that is not whole

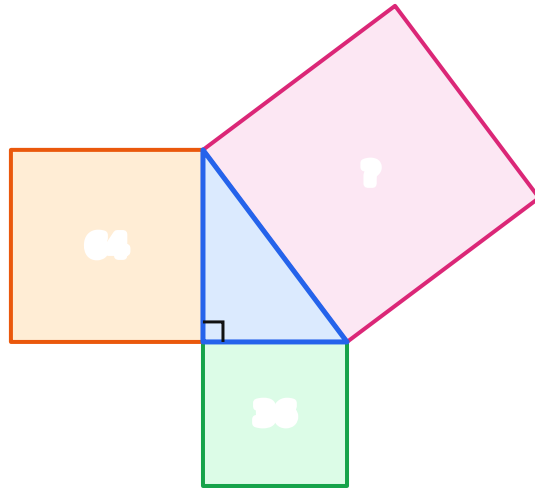
A right triangle has legs of 4 ft and 7 ft. Find the hypotenuse. Give the exact value and then round to the nearest tenth.

Problem 7: Leg that is not whole

The hypotenuse of a right triangle is 13 in. One leg is 9 in. Find the other leg to the nearest tenth.

Problem 8: Squares on the sides

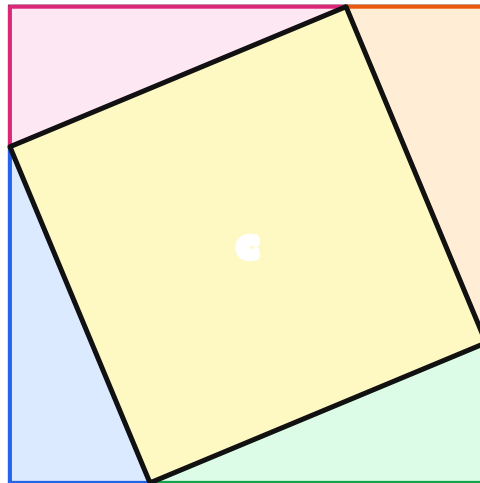
The squares built on the legs of a right triangle have areas 36 square units and 64 square units. Find the area of the square on the hypotenuse and the length of the hypotenuse.



Areas of the two leg squares are given.

Problem 9: Area proof with numbers

A square with side length 17 in. holds four congruent right triangles with legs 5 in. and 12 in. and a tilted square. (a) Find the area of the large square. (b) Find the total area of the four triangles. (c) Find the area of the tilted square. (d) Find its side length.



Four triangles with legs 5 and 12 fill the corners.

Problem 10: Explain the proof

In the square-and-triangles figure, the large square has side $a+b$ and the tilted square has side c . Explain, using areas, why $a^2+b^2=c^2$.

Problem 11: Converse: 9, 12, 15

A triangle has sides 9 in., 12 in. and 15 in. Is it a right triangle? Explain.

Problem 12: Converse: 7, 10, 12

A triangle has sides 7 ft, 10 ft and 12 ft. Is it a right triangle? Explain.

Problem 13: Which sets are right triangles?

Which of these side lengths form a right triangle? Show the check for each.

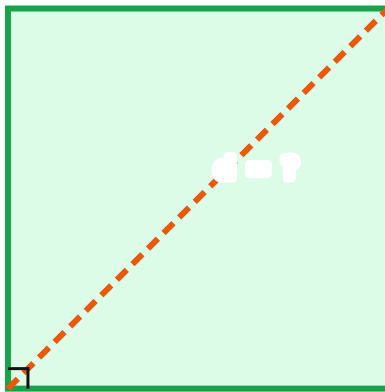
- a. 8, 15, 17
- b. 6, 7, 10
- c. 20, 21, 29
- d. 11, 12, 18

Problem 14: Perimeter and area

The legs of a right triangle measure 10 in. and 24 in. Find the perimeter and the area.

Problem 15: Diagonal of a square

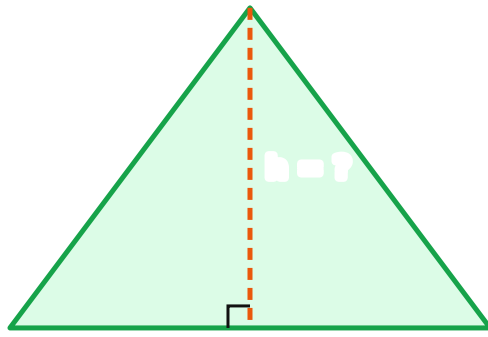
A square picture frame is 9 in. on each side. Find the length of its diagonal to the nearest tenth.



A diagonal splits the square into two right triangles.

Problem 16: Height of an isosceles triangle

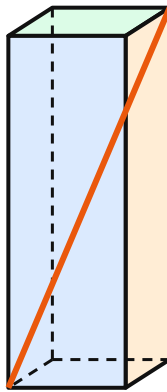
An isosceles triangle has a base of 12 in. and two equal sides of 10 in. Find its height. Then find its area.



The height splits the base into two parts of 6 in.

Problem 17: Diagonal of a prism

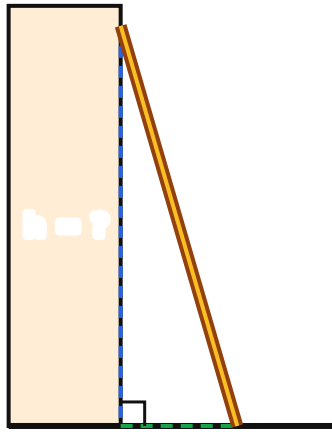
A rectangular prism is 8 in. long, 6 in. wide and 24 in. tall. Find the length of the space diagonal, from a bottom corner to the opposite top corner.



Find the space diagonal.

Problem 18: Ladder against a house

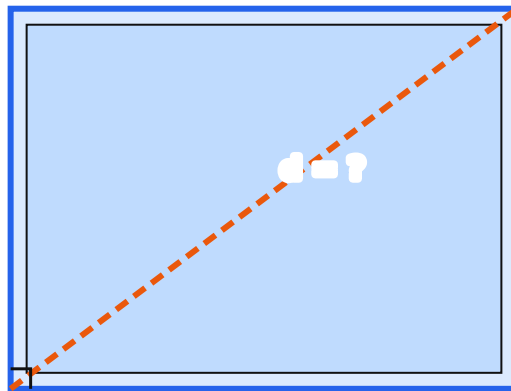
A 25-ft ladder leans against a house. Its base is 7 ft from the wall. How high up the wall does the ladder reach?



The ladder is the hypotenuse.

Problem 19: TV screen diagonal

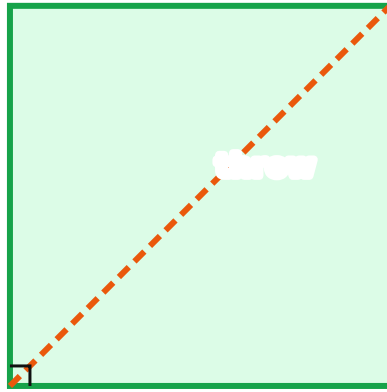
A TV screen is 24 in. wide and 18 in. tall. TVs are sold by the length of the screen diagonal. What size is this TV?



Screen width and height.

Problem 20: Little League throw

A Little League infield is a square with 60 ft between bases. The catcher at home plate throws to second base. How far is the throw to the nearest tenth of a foot?



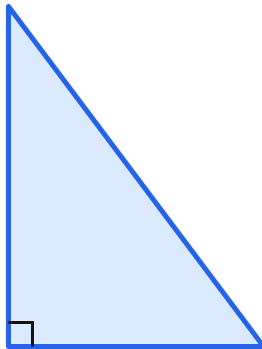
Home plate is at the bottom left and second base is at the top right.

Problem 21: Is the corner square?

Sofia builds a rectangular door frame. She measures 60 in. along the bottom and 80 in. up the side. The diagonal between those two points measures 100 in. Is the corner a right angle? Explain.

Problem 22: Walk east and north

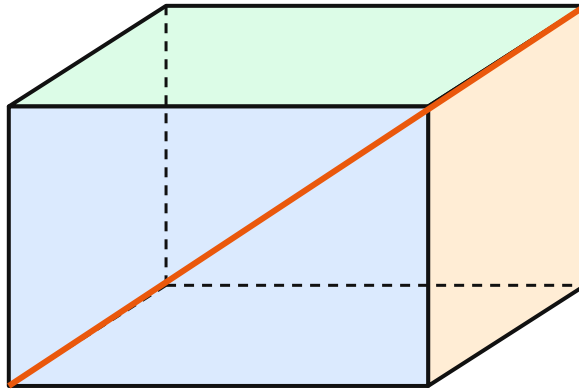
Jamal walks 0.9 mi east and then 1.2 mi north. How far is he from where he started, in a straight line?



East and north make a right angle.

Problem 23: Longest rod in a box

A storage box is 12 in. long, 9 in. wide and 8 in. tall. Maya wants to store a straight rod that is 17 in. long. Will it fit inside the box? Explain.



The longest straight rod lies along the space diagonal.