LESSON MAKER PRO

Right Triangle Routes

Find exact lengths in diagrams and real situations.

HIGH SCHOOL · G-SRT.8

G-SRT.8 "Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems and rewrite expressions involving radicals to simplify and interpret solutions.*"

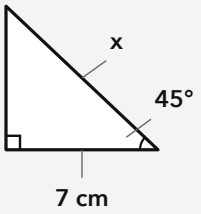
NAME _____ DATE _____

CHOOSE A RELATIONSHIP

Use the marked angle to identify the opposite leg, adjacent leg, and hypotenuse. Then choose sin θ = opposite/hypotenuse, cos θ = adjacent/hypotenuse, tan θ = opposite/adjacent, or $a^2 + b^2 = c^2$. Leave exact answers in simplest radical form.

WORKED EXAMPLE

Find x.

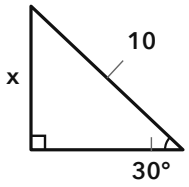


1. The other acute angle is also 45°.
2. The legs are equal, so each leg is 7 cm.
3. $x^2 = 7^2 + 7^2 = 98$.
4. x = sqrt(98) = 7sqrt(2) cm.

Answer: 7sqrt(2) cm

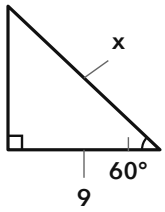
PRACTICE 6 problems

1 Find x.



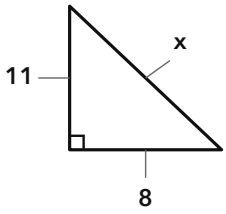
ANSWER _____

2 Find x.



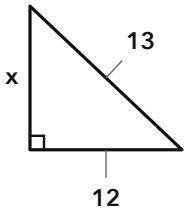
ANSWER _____

3 Find x in simplest radical form.



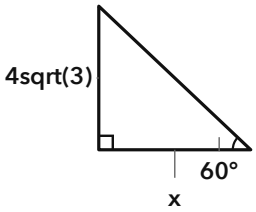
ANSWER _____

4 Find x.



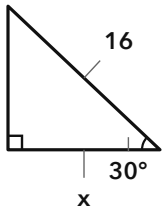
ANSWER _____

5 Find x.



ANSWER _____

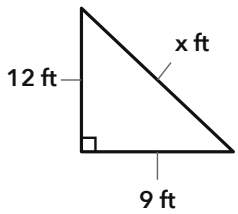
6 Find x in simplest radical form.



ANSWER _____

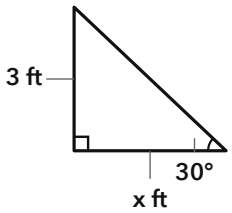
APPLY IT Show your work

1 A straight cable connects a wall-mounted display to a console on the floor. The diagram models the wall, floor, and cable. How long is the cable?



ANSWER _____

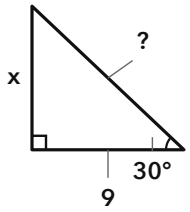
2 A skate park builds a practice ramp. The diagram shows its height and angle with the ground. Find its exact horizontal run.



ANSWER _____

CHALLENGE One step up

Find x and the hypotenuse. Show how the Pythagorean Theorem helps you find the hypotenuse.



WORK SPACE AND ANSWER

Right Triangle Routes

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find x.	**5**
2	Find x.	**18**
3	Find x in simplest radical form.	**sqrt(185)**
4	Find x.	**5**
5	Find x.	**4**
6	Find x in simplest radical form.	**8sqrt(3)**

PART 2 · APPLY IT

1. **15 ft** The cable is the hypotenuse. Its length is sqrt(9^2 + 12^2) = sqrt(225) = 15 ft.
2. **3sqrt(3) ft** Use tan 30° = 3/x. Since tan 30° = sqrt(3)/3, x = 3sqrt(3) ft.

CHALLENGE

x = 3sqrt(3). The hypotenuse is sqrt(9^2 + $(3\sqrt{3})^2$) = sqrt(108) = 6sqrt(3).

Accept equivalent exact radical forms, but not decimal approximations. For the challenge, the explanation should show that the squares of the two legs add to the square of the hypotenuse.