LESSON MAKER PRO

Right Triangle Routes

Find missing lengths with sine, cosine, and tangent.

HIGH SCHOOL · G.RT.1

G.RT.1 "Apply mathematical relationships of right triangles and trigonometric ratios to solve real-world and mathematical problems. Apply the distance formula, the Pythagorean theorem..."

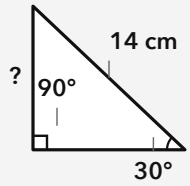
NAME _____ DATE _____

CHOOSE A RATIO

From the marked acute angle, the opposite side is across the triangle, the adjacent side touches the angle, and the hypotenuse is across from the right angle. Use sin = opposite/hypotenuse, cos = adjacent/hypotenuse, or tan = opposite/adjacent, then solve for the missing length.

WORKED EXAMPLE

Find the side marked ?.



1. The unknown side is opposite the 30° angle.
2. sin 30° = x/14.
3. 1/2 = x/14, so x = 7.

Answer: 7 cm

PRACTICE 4 problems

1 A 60° angle has an adjacent leg of 9 cm. Find the opposite leg.

ANSWER _____

2 A 45° angle has a hypotenuse of 8 m. Find the opposite leg.

ANSWER _____

3 A 60° angle has a hypotenuse of 12 in. Find the adjacent leg.

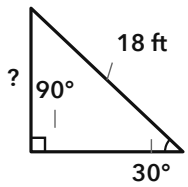
ANSWER _____

4 A 30° angle has an opposite leg of 5 ft. Find the hypotenuse.

ANSWER _____

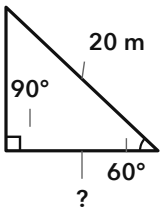
APPLY IT Show your work

1 A skatepark plans the ramp shown. How high is its top?



ANSWER _____

2 The diagram shows a drone's view of a ground target. How far is the target from the spot directly below the drone?



ANSWER _____

CHALLENGE One step up

A floor-mounted stage light is 15 ft from a wall. Its beam points 30° above the floor. Find the beam's length to the wall and its height on the wall. Give exact answers.

WORK SPACE AND ANSWER

ANSWER KEY

Right Triangle Routes

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A 60° angle has an adjacent leg of 9 cm. Find the opposite leg.	**9sqrt(3) cm**
2	A 45° angle has a hypotenuse of 8 m. Find the opposite leg.	**4sqrt(2) m**
3	A 60° angle has a hypotenuse of 12 in. Find the adjacent leg.	**6 in**
4	A 30° angle has an opposite leg of 5 ft. Find the hypotenuse.	**10 ft**

PART 2 · APPLY IT

1. **9 ft** The height is opposite the 30° angle. Multiply the 18 ft hypotenuse by sin 30° = 1/2.
2. **10 m** The ground distance is adjacent to the 60° angle. Multiply the 20 m hypotenuse by cos 60° = 1/2.

CHALLENGE

Beam length: 10sqrt(3) ft; height: 5sqrt(3) ft

Accept equivalent exact radical forms. For the challenge, tan 30° gives the height, and cos 30° gives the beam length.