LESSON MAKER PRO

Triangle Area Angles

Find exact areas using two sides and their included angle.

HIGH SCHOOL · PC.T.2.3

PC.T.2.3 "Use trigonometry to find the area of triangles."

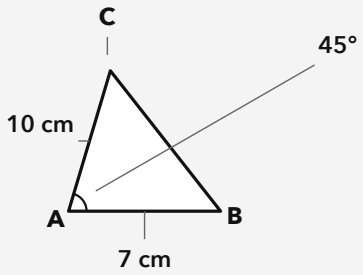
NAME _____ DATE _____

AREA FROM TWO SIDES

When you know two sides of a triangle and the angle between them, use A = 1/2 ab sin(C) to find its area. The sine gives the part of one side perpendicular to the other, so the rule works for acute and obtuse triangles.

WORKED EXAMPLE

Find the area of the triangle shown.

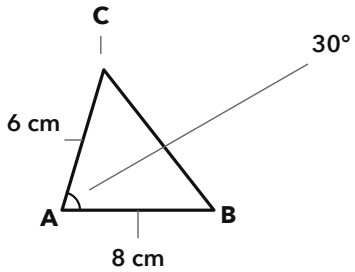


1. A = 1/2(7)(10)sin(45°).
2. sin(45°) = sqrt(2)/2.
3. A = 35(sqrt(2)/2) = 35sqrt(2)/2 cm^2.

Answer: 35sqrt(2)/2 cm^2

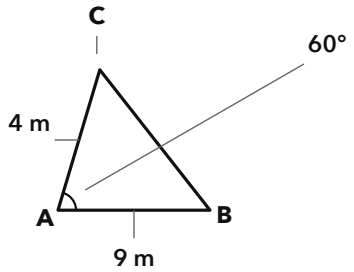
PRACTICE 6 problems

1 Find the area of the triangle shown.



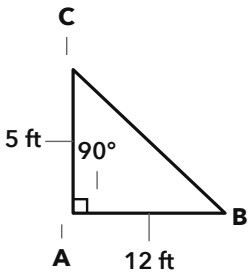
ANSWER _____

2 Find the area of the triangle shown.



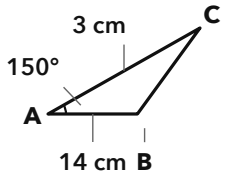
ANSWER _____

3 Find the area of the triangle shown.



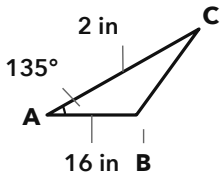
ANSWER _____

4 Find the area of the triangle shown.



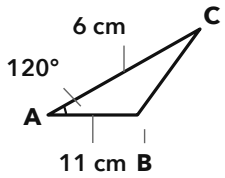
ANSWER _____

5 Find the area of the triangle shown.



ANSWER _____

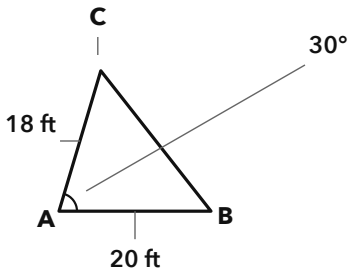
6 Find the area of the triangle shown.



ANSWER _____

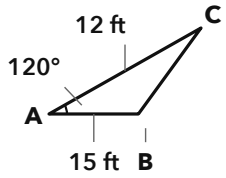
APPLY IT Show your work

1 Your club is painting the triangular mural shown. How many square feet will the mural cover?



ANSWER _____

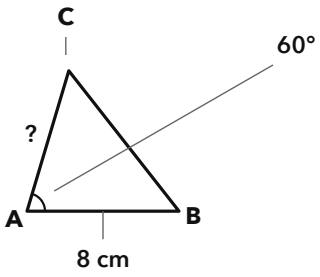
2 A festival crew is covering the triangular stage panel shown with LED film. How many square feet of film will cover it?



ANSWER _____

CHALLENGE One step up

The triangle shown has an area of 24sqrt(3) cm^2. Find the length of the side marked ?.



WORK SPACE AND ANSWER

ANSWER KEY

Triangle Area Angles

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the area of the triangle shown.	**12 cm^2**
2	Find the area of the triangle shown.	**9sqrt(3) m^2**
3	Find the area of the triangle shown.	**30 ft^2**
4	Find the area of the triangle shown.	**21/2 cm^2**
5	Find the area of the triangle shown.	**8sqrt(2) in^2**
6	Find the area of the triangle shown.	**33sqrt(3)/2 cm^2**

PART 2 · APPLY IT

1. **90 ft^2** Use the two marked edges and their included angle: A = 1/2(20)(18)sin(30°) = 90 ft^2.
2. **45sqrt(3) ft^2** Use the included angle: A = 1/2(15)(12)sin(120°). Since sin(120°) = sqrt(3)/2, the area is 45sqrt(3) ft^2.

CHALLENGE

12 cm

Accept equivalent exact forms, such as 10.5 cm^2 for 21/2 cm^2. For the challenge, solve 24sqrt(3) = 1/2(8)(x)sin(60°).