

Unit 4 Lesson 6

Area of Oblique Triangles

INVESTIGATION SCENARIO: Jackson the gardener is making a triangular garden. He knows that one side of fencing measures 10 feet and another side measures 24 feet. These two sides of fencing are joined at a 62° angle. He needs to know the area of the triangular plot of garden to know how much fertilizer to buy. Questions to ask yourself while solving Jackson's problem are:

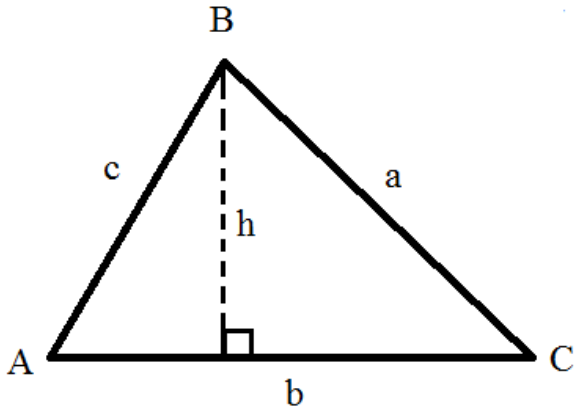
How can we relate our knowledge of the area of a triangle without having the proper information? What information do you need to solve for the area of a triangle?

Question 1

- a) What is the formula to find the area of a triangle? What does each component mean?
- b) What component(s) are missing in the garden problem?
- c) Is there a way to find that missing information with what is given?
- d) What is the area of Jackson's garden?

Questions 2

Explain at each step: what is going on and if it is mathematically correct



$$(1) \sin A = \frac{h}{c}$$

$$(2) h = c \sin A$$

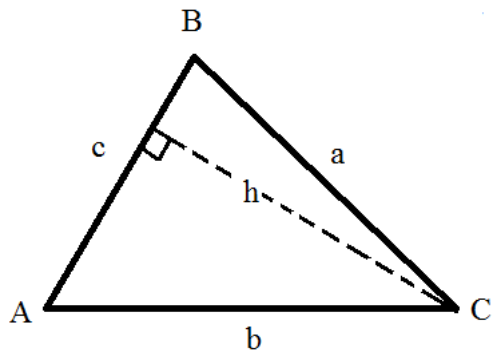
$$(3) \text{Area} = \frac{1}{2} (\text{base})(\text{height})$$

$$(4) \text{Area} = \frac{1}{2} b c \sin A$$

**SO WHAT IS THE AREA FORMULA FOR OBLIQUE
TRIANGLES?**

QUESTION 2

Explain at each step: what is going on and if it is mathematically correct.



$$(1) \sin B = \frac{h}{a}$$

$$(2) h = a \sin B$$

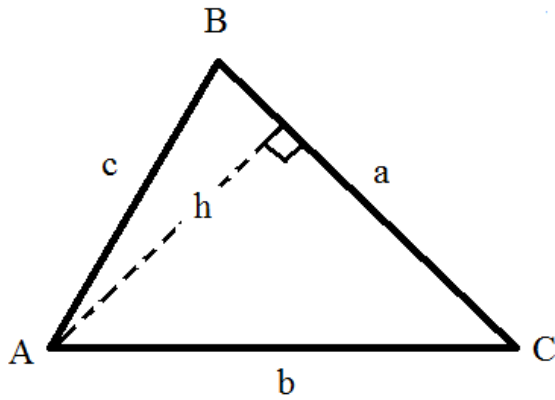
$$(3) \text{Area} = \frac{1}{2} (\text{base})(\text{height})$$

$$(4) \text{Area} = \frac{1}{2} c a \sin B$$

**SO WHAT IS THE AREA FORMULA FOR OBLIQUE
TRIANGLES?**

QUESTION 2

Explain at each step: what is going on and if it is mathematically correct.



$$(1) \sin C = \frac{h}{b}$$

$$(2) h = b \sin C$$

$$(3) \text{Area} = \frac{1}{2} (\text{base})(\text{height})$$

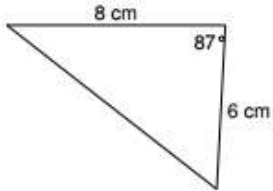
$$(4) \text{Area} = \frac{1}{2} a b \sin C$$

**SO WHAT IS THE AREA FORMULA FOR OBLIQUE
TRIANGLES?**

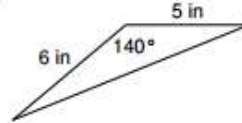
Practice Problems:

Find the area of each figure. Round your answer to the nearest tenth.

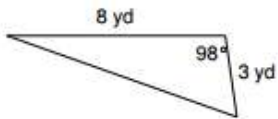
1)



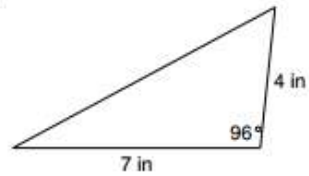
2)



3)



4)



5) A triangle with two sides that measure 6 yd and 2 yd with an included angle of 10° .

6) A triangle with two sides that measure 6 m and 8 m with an included angle of 137° .

Name: _____ Date: _____

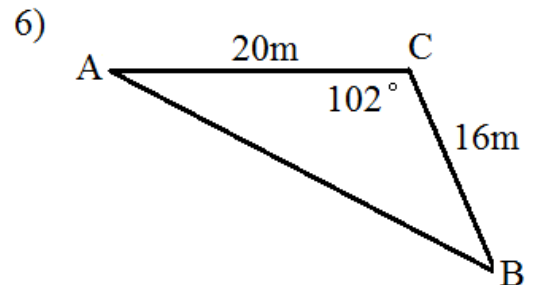
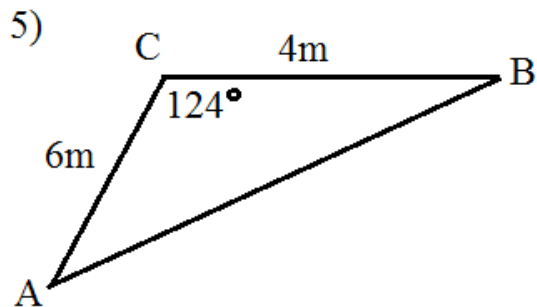
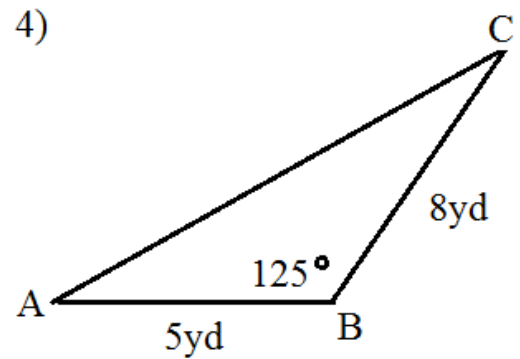
UNIT 4 LESSON 6 Graded Practice

Find the area of the triangle having the given measurements

1) $A = 48^\circ, b = 20 \text{ ft}, c = 40 \text{ ft}$

2) $A = 22^\circ, b = 20 \text{ ft}, c = 50 \text{ ft}$

3) $B = 36^\circ, a = 3 \text{ yd}, c = 6 \text{ yd}$



7) A triangular field is surveyed. The length of one side of the field measured 365 meters and another was 267 meters. The angle between these two sides was 100° . What is the area of the farmer's field?

8) Find the area of a triangle with two sides that measure 5 cm and 8cm with an included angle of 39° .

9) Find the area of a triangle with two sides that measure 8ft and 7ft with an included angle of 30° .