

Problem 1

Two people located 500 yards apart have spotted a hot air balloon. The angle of elevation from one person to the balloon is 67° . From the second person to the balloon the angle of elevation is 46° . How high is the balloon when it is spotted?

Draw and label related figure

Show work that will justify your answers

Problem 2

A surveyor needs to determine the distance across a lake between an existing ferry dock at point A and a second dock across the lake at point B . He locates a point C along the shore from the dock at point A that is 750 meters away. He measures the angle at A between the sight lines to points B and C to be 65° and the angle at C between the sight lines to points A and B to be 82° . How far is it from the dock at A and the dock at B ?

Draw and label related figure

Show work that will justify your answers

Problem 3

At the base of a pyramid, a surveyor determines that the angle of elevation to the top is 53° . At a point 75 meters from the base, the angle of elevation to the top is 35° . What is the distance from the base of the pyramid up the slanted face to the top?

Draw and label related figure

Show work that will justify your answers

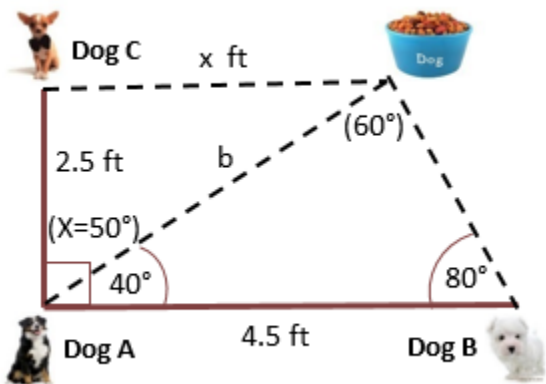
Challenge problem

Three dogs are sitting in a kitchen and waiting to get their dog food. It turns out that Dog A is **4.5** feet from Dog B, and Dog C is **2.5** feet from Dog A, as shown in the diagram below (note that the three dogs' positions form a right (90°) angle).

The angles formed at Dogs A and B to the dog food are 40° and 80° , respectively, as shown in the diagram. How far is Dog C from the dog food?

Related figure

Show work that will justify your answers



State the number of possible triangles that can be formed using the given measurements.

1) $m\angle C = 63^\circ, b = 9, c = 12$

4) $m\angle B = 33^\circ, a = 27, b = 22$

2) $m\angle B = 29^\circ, a = 14, b = 19$

5) $m\angle B = 95^\circ, b = 24, a = 5$

3) $m\angle A = 29^\circ, c = 18, a = 17$

6) $m\angle B = 35^\circ, a = 24, b = 6$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

Your mathematics teacher states that you only have to do TWO of the problems below.

Which TWO should you pick?

Explain WHY you made your decision: HINT: Pictures could be helpful

<p>Obtuse triangle 1 $m\angle A = 100$ $a = 12$ $b = 15$</p>	<p>Obtuse triangle 2 $m\angle A = 100$ $a = 15$ $b = 9$</p>	<p>Obtuse triangle 3 $m\angle A = 100$ $b = 15$ $c = 9$</p>
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