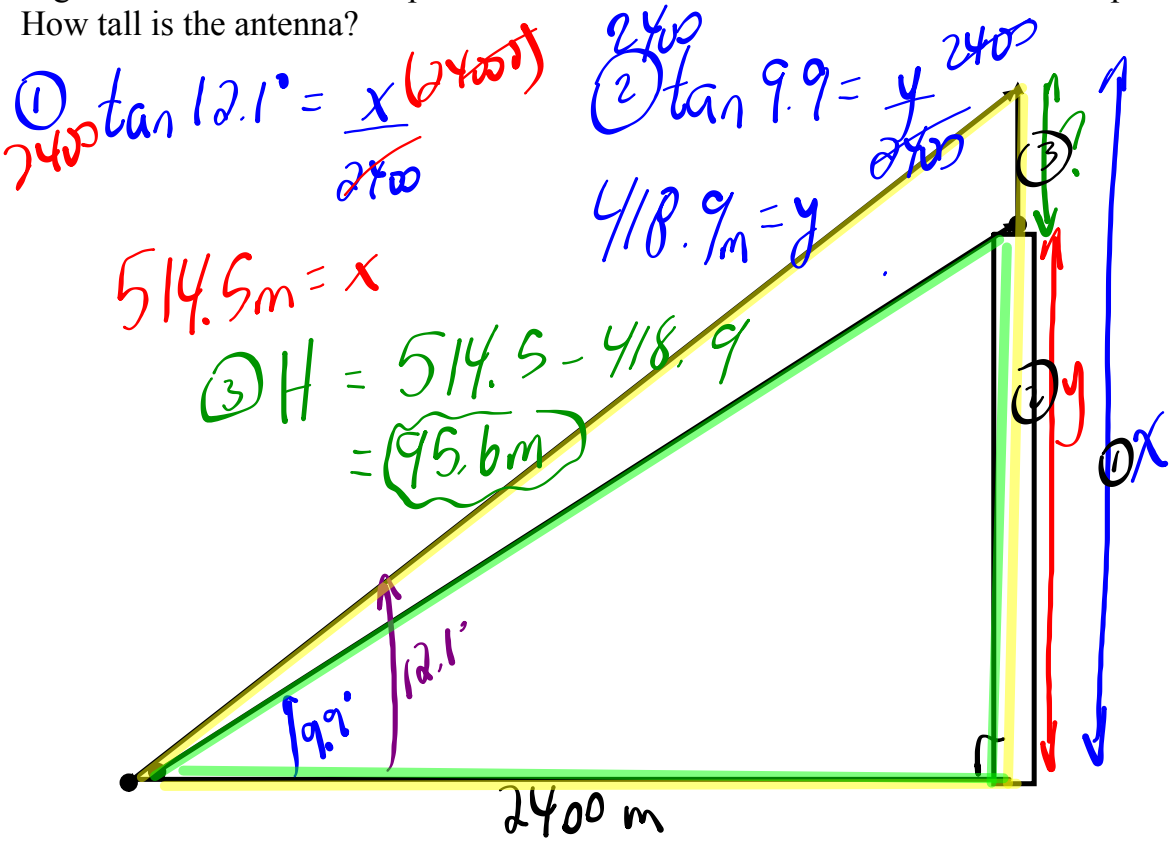
Foundations of Math 11 - March 12

HOMEWORK: Booklet exercise 10.7 #2, 3, 10, 11ab AND 10.8 #1, 3, 4, 6

NOTE: If you were absent you will need to get a booklet next day back

WARM-UP...

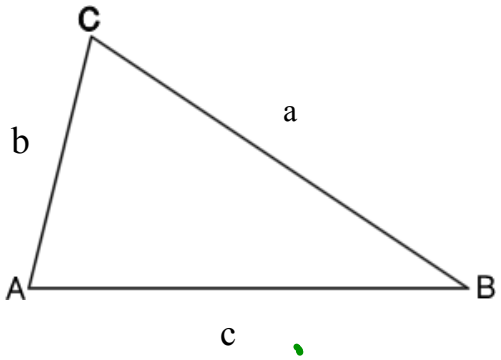
An antenna is on the top of the CN Tower in Toronto. From a point 2400 m away, the angles of elevation to the top and bottom of the antenna are 12.1 º and 9.9º respectively. How tall is the antenna?



Law of Sines

** **Used when the triangle does not contain a 90°** angle (Oblique Triangle)
** In order to use you must be given 1) an angle and an opposite side
AND
2) any other side or angle
Lower case letters "a,b,c" represent side lengths
Upper case letters "A,B,C" represent angle measures

Let's derive the Law of Sines...



Law of Sines

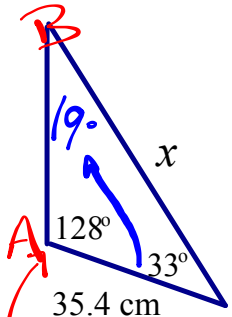
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

"when looking for a side"

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

"when looking for an angle"

EXAMPLE #1 - Finding a side.



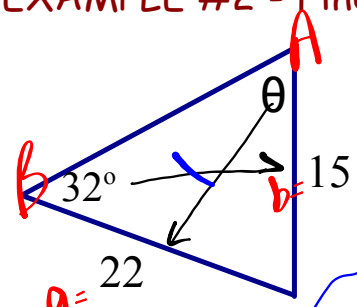
Obtuse

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

$\frac{x}{\sin 128} = \frac{35.4}{\sin 19}$

$x = 85.68$ cm

EXAMPLE #2 - Finding an angle.



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

$\frac{\sin\theta}{22} = \frac{\sin 32°}{15}$

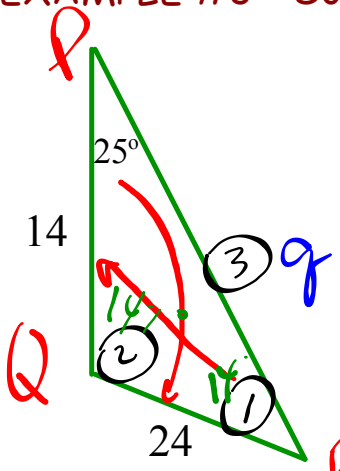
$\sin\theta = (0.7772)$

$\theta = 51°$

NOTE
When writing a trig ratio go to 4 places after the decimal

EXAMPLE #3 - Solve the triangle.

$\frac{a}{\sin A} = \frac{b}{\sin B}$ OR $\frac{\sin A}{a} = \frac{\sin B}{b}$



$\frac{14}{\sin R} = \frac{24}{\sin 25°}$

$\sin^{-1}\ \sin R = (0.2465)$

$\angle R = 14°$

$\angle Q = 141°$ $\quad 180 - 25 - 14$

$\frac{q \sin 141°}{\sin 141°} = \frac{24 \sin 141°}{\sin 25°}$

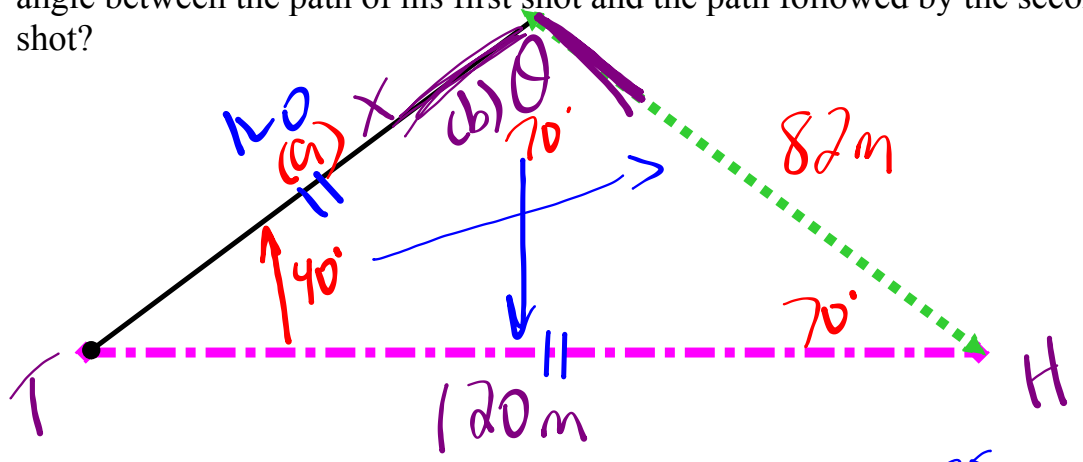
$q = 35.7$

EXAMPLE #4 - Application

Suppose that Mr. Watters was playing a straight par-3 golf hole that was 120 m long. He hits one of his regular old slices that ends up 40 ° off line and is still 82 m from the hole.

(a) How far did his tee shot travel?

(b) If he somehow miraculously hits his next shot onto the green, what was the angle between the path of his first shot and the path followed by the second shot?



b) $\frac{\sin\theta}{120} = \frac{\sin 40}{82}$

$\sin^{-1}\sin\theta = \sin^{-1}(0.9407)$

$\theta = 70°$

a) $\frac{x \sin 70}{\sin 70} = \frac{82 \sin 70}{\sin 40}$

$x = 119.9\text{ m}$

Homework...

Worksheet - Law of Sines.doc

10.9

Left Side...

#1 - 6

10.10

Right Side...

#1 - 3