Today's Learning Goal(s):

Date: _____
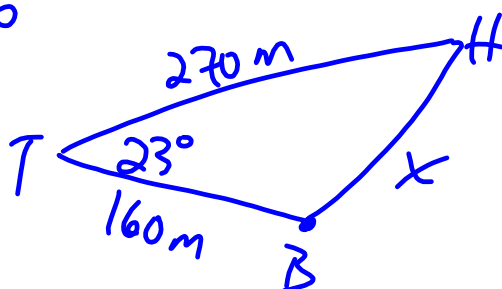
By the end of the class, I will be able to:

a) solve three dimensional problems using trigonometry.
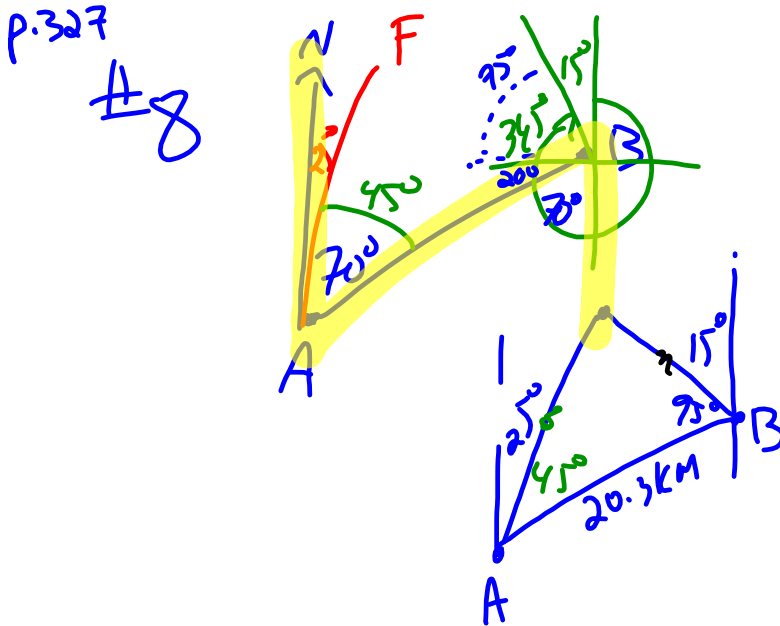
Last day's work: pp. 325-327 #1b, 2b, 3bc, 4ac, 5, 6, 8 [12,14]

p.326

#6

$$x^2 = 160^2 + 270^2 - 2(160)(270)\cos 23°$$

p.327

#8

## 5.8　Solving 3-Dimensional Problems Using Trigonometry

Date: Nov. 23/15

Success Criteria:
- sketch a diagram
- ask: **Is it a Right Triangle?**
  - » If yes, use SOH CAH TOA
- ask: **Is there an Opposite Pair?**
  - » If yes, use Sine Law (don't forget the ambiguous case!)
- ask: **Is there a contained angle, or all 3 sides given?**
  - » If yes, use Cosine Law
  - » Are you finding a side or an angle?
- sub in the numbers, and isolate the variable
- use your calculator to solve
- give a concluding statement
- ensure you have answered the question asked

Ex. 1
To determine the height of a hill, you measure the angle of elevation of the top to be 30º .
You then move 1000 m closer and find the angle of elevation to be 40º.
Calculate the height of the hill, to the nearest m.
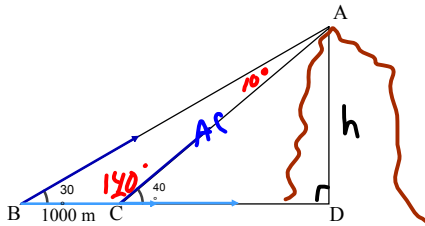
$$\frac{AC}{\sin 30°} = \frac{1000}{\sin 10°}$$

$$AC = \sin 30° \times \frac{1000}{\sin 10°}$$

$$\doteq 2879.38$$

$$\doteq 2879.4$$

$$\sin 40° = \frac{h}{AC}$$

$$h \doteq \sin 40° (2879.4)$$

$$\doteq 1850.83$$

$$\doteq 1851 \text{ m}$$
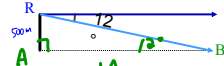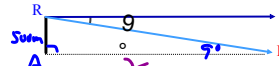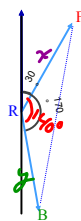
∴ the height of the hill is 1851 m.

Ex. 2
Ranger Rick is in his watch tower 500 m above a valley floor.
He spots "smoke" on a bearing of 030º (N30ºE). The angle of depression is 12º.
Fireman Bob is on a bearing of 170º (S10ºE) and his angle of depression is 9º.
How far, to the nearest m, is Fireman Bob from the fire?

From Above   *From Ground Level*

in △ RAF
$$\tan 9° = \frac{500}{x}$$

$$X = \frac{500}{\tan 9°}$$

$$\doteq 3156.87$$

in △ RAB
$$\tan 12° = \frac{500}{y}$$

$$y = \frac{500}{\tan 12°}$$

$$\doteq 2352.31$$

5184 m

in △ RFB
$$FB^2 = x^2 + y^2 - 2xy \cos 140°$$

$$= 3156.8^2 + 2352.3^2 - 2(3156.8)(2352.3)\cos 140°$$

$$FB = \sqrt{}$$

$$\doteq 5184.2$$

$$\doteq 5184 \text{ m}$$

∴ Fireman Bob is 5184 m from the fire.

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 325-327 #1b, 2b, 3bc, 4ac, 5, 6, 8 [12,14]

Today's Homework Practice includes:

pp. 332-335 #3 – 6 [7, 14]