

4. Always, always, always break down your problem into answering the following three questions:

4

- i. What is known? Write down what is given. Write down and determine what facts are directly given or that can be derived from what is stated or seen in the problem diagram. Note: It can be VERY IMPORTANT for you to draw a diagram or picture of the situation. It is NOT always given. Or you might add to the picture that is given, like I do below here for you (Photoshop).

WHAT given?

This is your ammunition for trying to hit the target. Your bow and arrows.

Or this is your fuel for taking you from the starting point to the destination, from the given to the goal.

- ii. What is unknown? What is the goal? What is the result that is desired? What is the question asking for? That is your target! That is your destination!

WHAT is goal?

- iii. How can you get from i. (given) to ii. (goal).

HOW to get from i to ii

You now have a clear idea of where you are at, and of where you want to go.

What formulas or past similar problem and trips can help you get from i. to ii.?

Ecto 1 or car to travel.

You might need the SINE or COSINE or TANGENT. Or for Monte Carlo you might need the

$$a = \frac{b}{c} d \quad \text{formula.}$$

Or you might need the slope =  $\frac{\text{rise}}{\text{run}}$

formula where rise =  $(y_2 - y_1)$  and run =  $(x_2 - x_1)$

etc. etc. etc.

Mobilize knowledge about circles, slopes, right triangles, points, distances between points, trigonometry that is relevant to the current problem and the i. given facts that you have WRITTEN DOWN and isolated and the ii. relevant GOAL that you have also WRITTEN DOWN as your clear target.

The 9 diagram

mobilize  
isolate  
combine

Ghostbusters

5. The three steps above are represented by the three Ghostbusters characters:

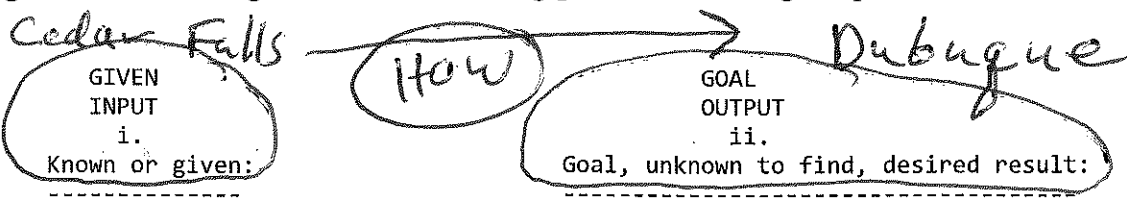
5

- i. WHAT is given? Dr. Peter Venkman  
WHAT is the goal?
- ii. HOW to get from Dr. Raymond Stantz  
i. given start to  
ii. the desired result or goal.
- iii. Solve the problem using whatever tools (Netlogo, Vensim, calculator) and algebra you need to do.  
Dr. Egon Spengler

8.) Is there another way to find the ycor, given that we know the xcor, i.e. we know the length of the ADJACENT LEG to the 30 degree angle?

8) Yes. Knowing the adjacent leg has length 8.66 units and knowing the angle is 30 degrees and having as our goal what is the length of the OPPOSITE Leg gives the following setup:

Ecto 1 is the Ghostbusters Vehicle, their car.



Angle  
30 degrees

Adjacent side length  
8.66 units

Length of OPPOSITE side,  
opposite leg of the  
triangle, side opposite  
the 30 degree angle.

How do you get from i. to ii. from given to goal?

TOA = Tangent Opposite Adjacent

$$\text{Tangent} = \frac{\text{Opposite}}{\text{Adjacent}} = \frac{\text{opp}}{\text{adj}} = \frac{O}{A}$$

Remember by thinking of stubbing your TOA...

So the TOA formula is suggested when you focus on the fact that you know the 30 degrees and can get the T Tangent, thus with a calculator know the Tangent of 30 degrees,

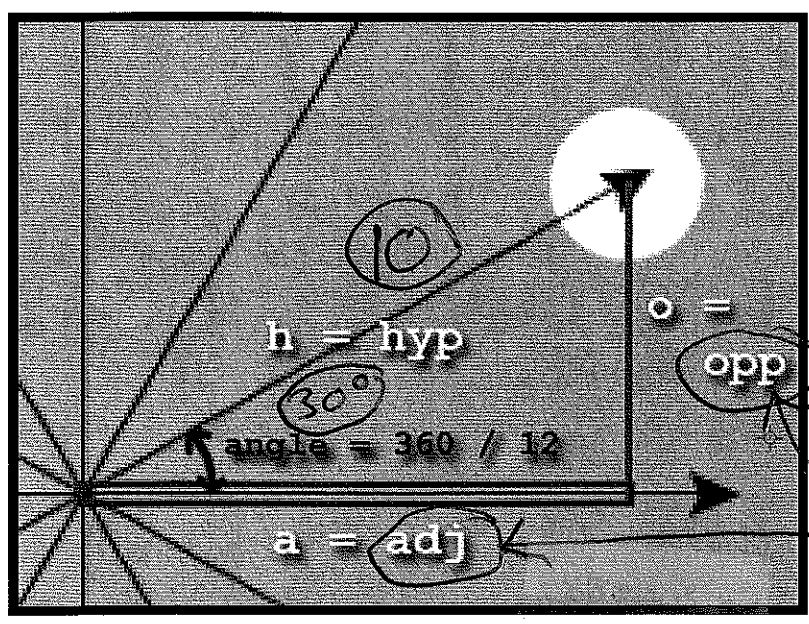
and you know the length of the adjacent leg to the 30 degree angle, which is 8.66.

$$\text{Tan}(30) = 0.57735 = \frac{\text{opposite}}{8.66} \text{ so } 8.66 * 0.57735 = \text{opposite length}$$

and 4.99985 - opposite length

thus 5.0 = ycor

i) UNIT  
ii) your hometown or concert city TRAVEL -



fd 10  
cvo 12  $\frac{360}{12} = 30$   
Given  $\rightarrow 12 \rightarrow \frac{360}{12} = 30$   
10  
Goal  $\rightarrow$  o or opp or ycor  
GOALS  $\rightarrow$  a or adj or xcor