2) Let us look at Example 16-15 on page 399 of the text.

First: Name the sides of the given **right triangle.** We label the sides of the triangle with respect to the **acute (less than 90 degrees) angle** that they give us or the angle that they ask us to find. In this problem they give us the angle of **36.4 degrees** which is the angle of elevation in the bottom right corner of the triangle.

Once you have located the angle that they gave us or asked us to find then you can label the names of the sides of the **right triangle.** The hypotenuse (the side opposite the right angle) is the **slanted side** and we do not know its length.

Next we label the **opposite** side which is the side opposite the **36.4 degrees angle** and in this problem it is the height of the cliff and it is the same **length as h in the diagram.** The **last side** that we label is the adjacent side, in this problem it is the side along the bottom of the triangle and its measure is 100m. If you always **label the hypotenuse** and **opposite sides first** then the **adjacent side** will always be the side that is remaining.

Second: Now we need to determine which of the three trigonometric formulas we should use to solve this problem. I tell the students to write down what they know **(that is what do they have a numbers for)** and what they are asked to find. **Two** out of these **three** things should be **sides** and that determines which trig formula to use. In this problem we know (have numbers for)

Know	Find
Angle (36.4)	Opposite (height of the cliff) h
Adjacent(100)	

Out of our **three items** in know and find the two sides mentioned are adjacent and opposite. If I look at the three trig functions that we are responsible for on page 395:

sin=opposite/hypotenuse

Cos=adjacent/hypotenuse

Tan=opposite/adjacent

I see that the trig function that uses the two sides mentioned is the tangent **(tan) function.** We now take this formula and **substitute** our values into this formula.

tan=opp/adj

tan 36.4=h/100

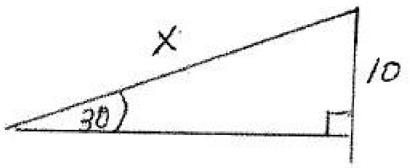
note: the acute angle always goes next to the trig function that you select.

0.737263585=h/100: I replaced **tan 36.4** with its value which is gotten by entering **[tan tan-1] [36.4] [enter]** and we get **0.737263585**
We now solve this equation for **h**. To get **h by itself** we need to get rid of a **dividing by 100** so we **multiply both sides by 100:**

(100)(0.737263585)=(100)(h/100)

73.7263585=h. We would now round off our answer to whatever degree of accuracy that was asked. In the book they rounded off to the nearest meter which would be 74 meters.

3) **Let us find side X in the following diagram.**



I locate the **acute angle** that they give us in this diagram, which is **30 degrees.** I label the hypotenuse which in this diagram is where the x is. I label the **opposite side** which in this problem is where the **10** is and finally I label the adjacent side which is the **bottom side of the triangle** which does not have a label or number. I now write down what I know (have numbers for) and what I need to find

Know	Find
Angle (30)	Hypotenuse(x)
Opposite (10)	

The two sides mentioned in know and find are opposite and hypotenuse. The trig function that uses these two sides is the sine function.

sin=opp/hyp substituting our values into this formula we get

sin 30=10/x Now we solve for **x**. I can replace **sin 30** with a number. **[sin sin-1] [30] [enter]** I get 1/2, If I strike the approximately equal to key**(the key above enter)** I get **.5**

.5=10/x This is what our problem becomes. Like the last unit we need to get the **x** out of the denominator so I will multiply both sides by **x x(.5) =x(10/x)** .

.5x=10 Now to get **x** by itself we need to get rid of a **multiplying by .5** so we divide by **.5**.

.5x/.5=10/.5 x=20

NOTE: in this last example sin 30=0.5, If the sin of the angle had been .385243 you would have had to divide by .385243 and **NOT ROUNDED OFF ANY NUMBERS UNTIL THE LAST STEP.**

I. Logic Gates

Logic gates with a large number of inputs will have a large number of input combinations. To calculate the number of possible input combinations, you may use the following formula:

$n=2^x$

Where **n=** the number of input combinations **x=** the number of inputs.
For example: If we had 3 inputs the number of input combination would be:

$n=2^x$

n=23

n= 8 input combinations

II.

If our 3 inputs were **A, B,** and **C**. The table for the input combinations would look like the table below:

A	B	C	
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

Notice the pattern of **0's** and **1's** for EACH column so that we can address all input combinations.

III.

If we had 4 inputs, the number of input combinations would be **n=24** so **n=16** combinations. The table for 4 input combinations, say A, B, C and D would look like the following table:

A	B	C	D	
0	0	0	0	
0	0	0	1	
0	0	1	0	
0	0	1	1	
0	1	0	0	
0	1	0	1	
0	1	1	0	
0	1	1	1	
1	0	0	0	
1	0	0	1	
1	0	1	0	
1	0	1	1	
1	1	0	0	
1	1	0	1	
1	1	1	0	
1	1	1	1	