Sent: Sunday, September 14, 2003 12:53 PM

Question:
I have a question about significant figures (specifically how they relate to problem 64, ch. 2). Because the distance given was 50m, which is one significant figure, each time I did a calculation in an equation, I rounded the answer to one significant figure. Thus, by the time I got to my final answer, it seemed very vague. So basically my question is: when solving a problem, does each formulas' answer need to be put into significant figures, or do I complete the entire problem using all the decimal places, and then round to significant figures?

Response:
Actually though the three numbers given in the problem end with a zero, you can interpret the first (50) as either 1 or 2 significant figures, and the other two (2.0 and 3.0) are definitely two significant digits. As a general rule, it is a good idea to carry all numbers to one more significant figure than you need to end up with. Hence, when I did this problem, I carried through with 3 significant figures. At the end, if you like, you can round by one digit ... but I would not do this during the calculation. (For example, subraction of two large numbers during a calculation will give an answer that is much less signifcant than the pieces.) Doing a calculation throughout to one significant digit is likely to result in an answer that's good to factor of two precision.
Hope this is useful,

Sent: Saturday, September 13, 2003 3:45 PM

Question:
I have a quick question about HW Problem 8P from Ch. 3. Part A seems straightforward, I just used the Pythagorean theorem to get the magnitude of AB, taking the square root of the sum AC^2+AD^2, but i am confused on Part B when they give the slop of the incline as 52 degrees. I am not sure how to approach it; are we to assume the magnitude of AB is the same as we found in Part A and that the X and Y components are now different? Any input would be appreciated.

Response:
The segment AB in the figure refers to a vector in 3-dimensions. Hence, it has three components: two in the horizontal plane and one vertical component. In the plane of the fault, the component AC is along one of the horizontal axes, but AD has both horizontal (the other one) and vertical components. Hence the vertical component of AD is also the vertical component of AB -- which is what is requested.

Sent: Saturday, September 13, 2003 1:13 PM

Re: Sample Problem 4-6 (pg. 58)

Question:
1) I just used the trajectory equation to find x and then the angle. Why did they go through the whole thing to find t? I know you need it in part (b) of the question, but even then I just divided 555.5/55 to get t.

Response:
The two methods (yours and the book's) are both correct -- and should give the same answer.

Question:
2) I'm not a pilot, but when I read the words "line of sight" it seems like it should mean what the pilot can see, i.e., the angle BELOW the x-axis. That would mean 90 degrees minus the angle in the picture. Is this some kind of pilotspeak that I just don't know?

Response:
The "line of sight" is the direction labeled as such in the picture in the text. This can be specified by either your angle or the one defined in the picture in the book. Either is correct.

Question:
3) The picture showing the velocity vector is really misleading. Shouldn't it separate from the trajectory arc? It appears to BE the same arc, and I spent a lot of time wondering why the trajectory equation didn't work out. Now I get it, but the picture confused me.

Response:
The velocity vector shown in the picture is velocity of the plane at the instant of release -- and therefore must equal the initial velocity of the package, as stated in the figure caption. This way of representing vectors at a specific instant is pretty standard, and the subscript (0) is commonly used to indicate the quantity when the clock starts (t=0).

Question:
And separately, what does it mean when a projectile is shot with a negative i-coordinate? (e.g. -20i + 70j) I know the j-coordinate means shot in the air or into the ground, but I'm not sure about the i. I think it means just shot in back of you, but the more I think about it I'm not sure.

Response:
You give no reference to where you mean in the text. If the vector you quote is a velocity with value -20i+70j, and the units are m/s, then the velocity x-component relative to your coordinate system is in the -x direction with magnitude 20m/s.

Wednesday, September 10, 2003 9:51 PM

Question:
i am having difficulty with one of the problems you assigned in your physics 1401 class. it is in chapter 2, problem #38. the train problem. i thought i had it correct but after hearing your hint i later realized that it was totally wrong. I am not scheduled to meet with a tutor until next week and I was wondering if you could re-provide this hint for me.

Response:
Without a more specific point, it is hard to comment except to elaborate as follows.

I attach the slide with the hint in hopes this might help (next page). The two equations referred to there are (1) the position of the train equals the position of the locomotive; (2) the speeds of the two are equal. Both these equations can be written in terms of the given quantities and two unknowns: the time they meet and the acceleration of the train.