Resolved Unresolved @10_f2

Actions

Nandini Bhat 2 months ago

I really liked the explanation about how the multiplier's units must be such that they can convert x's units to y's units. I just sort of knew that the result would be in terms of y's units, but I never really considered the multiplier's role in making that happen. I fiddled around with the equation in #24 to see this in action, by only using the units:

$$\frac{persons\ per\ year}{persons} \times persons = persons\ per\ year$$

As the "persons" variables are cancelled out, "persons per year" is the resulting unit.

Is this the right way to look at the unit conversion happening?

~ An instructor (Elisabeth stade) thinks this is a good comment ~

helpful! | 1

2 months ago

Yeah I really struggled to explain this one without saying something like "it just kinda has to be that way?" I was struggling for words that day. my brain has been mush recently.

helpful! | 0

2 months ago

Hey Nandini,

Thanks for providing this example. I found it helpful for me to complete / augment my explanation of this problem. I liked the verbal explanation of k provided in the book "per capita growth rate is X persons per year per X persons". This combined with your explanation helped me grok this problem!

helpful! | 0

Nandini Bhat 2 months ago

Actions

First of all, thanks so much! Your answer here helped me figure out a mistake I was making when trying to calculate k (namely, forgetting that C' would be -9 and not just 9).

I'm pretty late to the party but I do want to get used to posting answers as well. I did parts a) b) and c) in a similar fashion. I got some inspiration from your answer to part d), but took a different route:

We can make an estimate of the amount of time it would take for the coffee to cool from 180 degrees to 120 degrees by using the rates we calculated above. As the rate would keep changing in between 180 and 120, we could make a guess by taking the average of the rates they are cooling at for these temperatures, and then subtracting this rate from itself until it matches the difference between 180 and 120 (which is 60).

((-9) + (-4.05)) / 2= -6.53 Averaging rates

Now, to get as close to 60 as possible, we would have to add 6.53 to itself around 9 times (6.53 * 9 = 58.77). This means it takes around 9 minutes for the coffee to cool from 180 to 120 degrees.

A better way to do this is with code, as you can get more precise answers. In the code below, the user must input a start temperature, room temperature, *k* value, and end temperature. The *k* value is divided by 60 so that we calculate the rate, Cprime, in terms of seconds (*k* is originally per minute). A while loop is used to keep calculating the resulting temperatures as cooling occurs, so long as the start temperature is greater than the end temperature. A variable "seconds" keeps track of the seconds that have passed until reaching the end temperature- the seconds are converted to minutes after the loop breaks, giving us a more accurate time measure.

Resolved Unresolved @7_f1

2 months ago

Problem 9: Starting at the origin, and moving along the parabola y = x^2, where are you when you've gone a total distance of 10?

I'm not sure I understand this question. If the total length is < 10 (per the table given in problem 7), how do we figure out the point where the length is 10? Or is this asking for something else?

helpful! | 0

Nandini Bhat 2 months ago

Actions

Super late here because I JUST finished the assignment, but I tried doing this by fiddling with my x_final value until the resulting length was close to 10. x_final is the x coordinate once you've reached that distance, and as y = x^2, y = 3^2. So your coordinates would be at (3, 9) at distance 10. If you print out the final xr and yr values they reflect the same.

My reasoning behind doing this was that the length was only under 10 when our x_final was 1- the parabola can extend into infinity as it is not bounded, so if we increase our x_final, we can increase the distance we are measuring. Not sure if this makes any sense, my brain is kinda fried and this was one of the last questions I did.

helpful! | 0