Re: −−Ping Dave, changed my mind − I am still confused

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- *From*: Dave <dave_and_darla@xxxxxxxx>
- *Date*: Sat, 9 Feb 2008 21:25:35 −0800 (PST)

On Feb 9, 7:19 pm, "The poster formerly known as Colleyville Alan"
<nos...@xxxxxxxxxx> wrote:
...

> But, during the process of integration, I get ln|y| = −t + c. When I exponentiate both sides, I get |y| = e^(−t+c). Now, according to the definition of abs value, if the contents of y are positive, then |y| = y and if the contents of y are negative, then |y| = −y. Since the RHS has a positive e raised to some exponent, this value is positive and therefore y would be positive.

This is incorrect. What is the solution of |y| = 1? It is y = +− 1, because |1| = 1 and |−1| = 1. The fact that the right hand side is positive does not mean that y is positive. Similarly, |y| = e^(−t+c) means that y = +− e^(−t+c), because |e^(−t+c)| = e^(−t+c) and |−e^(−t +c)| = e^(−t+c).

> If I had raised a *negative* e to some power, then I would say |y| = −y, but since this is a positive e on the RHS, I do not see how that is possible in this case.

This doesn't follow. For example, the equation |y| = −1 has no solutions.

> I realize that the initial conditions require that c = −1 but if c_2 = e^c_1, then I do not see how c_2 can be = 0 in this case. So, even though I replaced e^c_1 with c_2, since c_2 represents e^c_1, it does not seem to me that I can simply treat it like an arbitrary constant; it is a constant, but one that is +e raised to some power of an arbitrary c_1.

Right. But this is where the +− sign comes in. c_2 is positive, so +c_2 is positive and −c_2 is negative. Writing c_3 = +−c_2, then c_3 can be positive if you choose the + sign and negative if you choose the − sign. Thus we can write $y = 2 + t + c_3 e^{-t}$, where c_3 is an arbitrary constant. If c_3 turns out to be negative, as it does in this case to fit the initial conditions, that simply means that we used the − sign in $+-c_2$. Recapping your various c values: $c_3 = -1$, $c_2 = 1$, and $c_1 = 0$, because $-1 = -1 = -e^0$.

Dave
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