

Re: Question regarding c^2

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On Oct 14, 3:28 pm, drblitzkr...@xxxxxxxx wrote:

Hey,

What is the significance of squaring the speed of light? c^2 is used so much in areas such as relativity, but what does the act of "squaring" represent?

I'm not sure I understand the question. It represents multiplying a number by itself.

I ask this because squaring is an operation the results of which will be totally different depending on the (arbitrary) units you use.

The resulting units will be the square of the units you started with.

I can say that the area of a square is s^2 , where s is the length of a side. The number will be totally different depending on what units I measure s in, but nevertheless that does not change the area. If I find out a square has area 10,000 square cm by starting with $s = 100$ cm, or $A = 1$ square meter by starting with $s = 1$ m, that isn't a "totally different result". One square meter and 10,000 square cm are the same thing.

Ie., I just presumed until now that squaring c will cause a larger dilation in its value if you use a smaller unit, such as km/h, vs. a larger unit, such as miles/h. What if you make up a unit of speed that is equal to c ? Then the speed of light would be 1, and squaring c would then just leave you with c again, so no need for the " 2 ". When scientists write " c^2 ", are they

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implying necessarily a certain unit, such as km/h?

No. Physical equations such as $E = \gamma mc^2$ better be true in all units, since units are human inventions and two humans can choose different units.

The relation $A = s^2$ for a square does not assume particular units for s .

– Randy

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