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MATH 365

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HW 3

2.3.3

2.3.3.1

Let be the speed, let be the volume, let be the size, and let be the weight of the raindrop.

Let be the size of the cloud.

The speed of the raindrop is proportional to the weight of the raindrop,

2.3.3.2

The weight of the raindrop is proportional to the size, or volume, of the raindrop,

2.3.3.3

The size of the raindrop is proportional to the size of the cloud,

For modeling the speed of the raindrop in terms of the size of the cloud, the following could state the relationship,

Since the size of the cloud is proportional to the weight of the raindrop we can also state the speed like,

And finally we get the original definition,

When modeling the speed in terms of the size of the cloud, the model does not make sense. The preceding relationships state that the only relationship between the size of the cloud, “Y”, is the size of the raindrop, “Z”. Therefore, the only way to model the speed in terms of the size of the cloud is with the following, “” the speed of the raindrop is proportional to the size of the raindrop. And since we stated that, “” the relationship that states, “” is the correct way of stating the speed of the raindrop in terms of the size of the cloud. This relationship makes sense not only with the preceding definitions but with the discussion that comes from example 2.3.3.

2.3.4

First statement, if is inversely proportional to ,

then we can say that there is an arbitrary nonzero constant that can say,

and vice versa.

Second statement, since is directly proportional to , then the following statement can be made,

and thus we can also say,

and vice versa.

From the previous relationships we can state the following,

or the following statement can be made,

to state that is inversely proportional to .