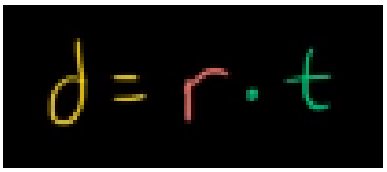
Dimensional Analysis

Rate Conversion:

We are told that **distance** = **rate** * **time**



Let's say an object moves at a rate of 5 meters per second:

… how far will it travel after 10 seconds?

Our formula is now:

The seconds will cancel out:

…leaving us with the answer of 50 meters:

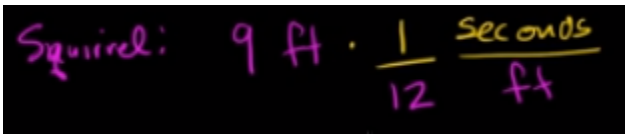
Rate Problem:

A squirrel is running across the road at 12 feet per second. It needs to run 9 feet to get across the road. How long will it take the squirrel to run 9 feet? Round to the nearest hundredth of a second.

A car is 50 feet away from the squirrel, driving toward it at a speed of 100 feet per second. How long will it take the car to drive 50 feet? Round to the nearest hundredth of a second.

Will the squirrel make it 9 feet across the road before the car gets there?

The rate for the squirrel:



… so it takes the squirrel .75 seconds to cross the distance of 9 feet across the street:

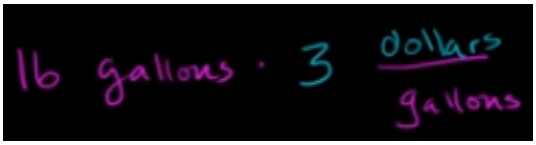
The rate for the car:

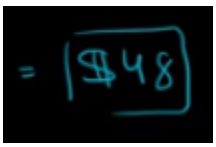
… so it takes the car .5 seconds to reach the spot where the squirrel is situated:

… and thus, unfortunately, the squirrel will not make it 9 feet across the road before the car gets there.

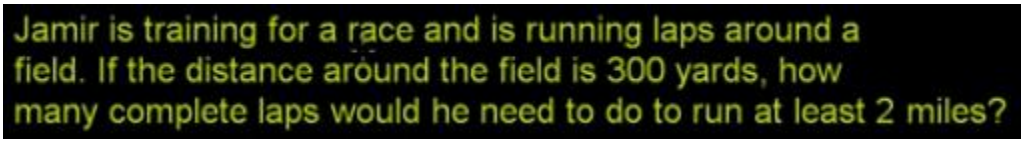
Word Problem with Multiple Units:

Your car gets 25 miles per gallon and you want to go on a 400 mile road trip. Right now, gas costs $3.00 per gallon. How much will the gas for your road trip cost?

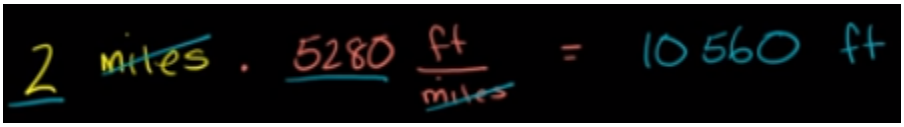


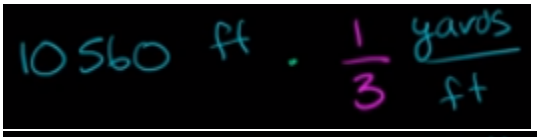


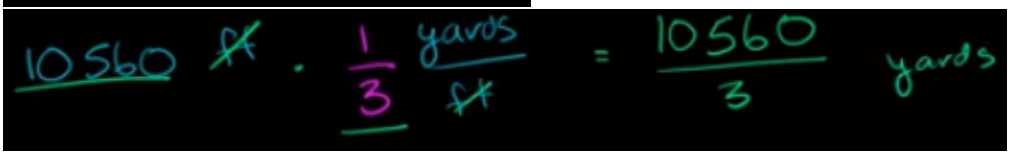
Measurement Word Problem:

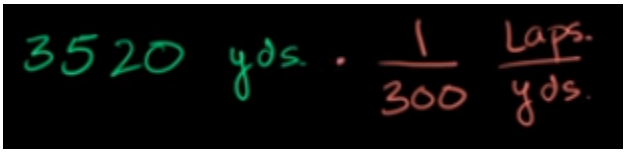


How many yards in 2 miles?





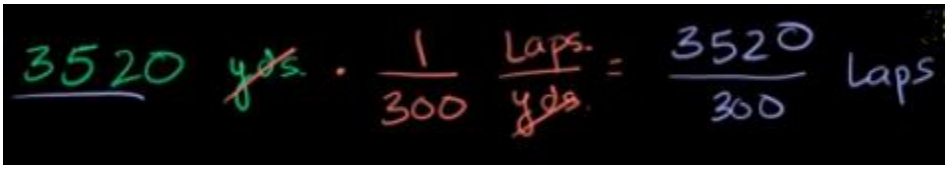




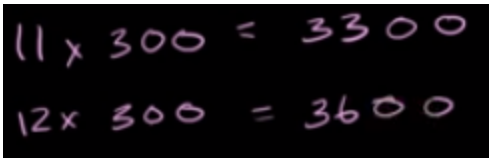
… so there are 3520 yards in 2 miles.

We know there are 300 yards in 1 lap.

Now how many laps can we fit in 3520 yards?



We see that 11 laps contains 3300 yards:



…the 11 laps would stop just short of the 3520 yards. Thus, he would need to run 12 laps to run at least 2 miles.