NOTES on Unit Analysis (AKA Dimensional Analysis)

Use Unit Analysis (Dimensional Analysis) for the following problem. A cheetah ran 300 ft in 2.92 sec. What is the cheetah's speed in mph (miles per hour)?

1st step: Identify the cheetah's speed as a Rate: $\frac{300\ ft}{2.92\ \text{sec}}$

2nd step: Before you start doing any math write down the units for your final answer. The UNITS in your answer should look like ⟶ $\frac{mi}{hr}$

3rd step: Set up the problem in the following method. You will need to use the following Units of measurement. 1 mi = 5,280 ft 1 min = 60 sec and 1 hr = 60 min (ALWAYS REMEMBER THAT UNITS CANCEL OUT (DIVIDE OUT) IF 1 IS ON TOP AND 1 IS ON BOTTOM)

$\frac{300\ ft}{2.92\ \text{sec}} \bullet \_\_\_\_\_ \bullet \_\_\_\_\_ \bullet \_\_\_\_\_$

Use a calculator to get the value of the Numerator ←

Use a calculator to get the value of the Denominator ←

Write answer to the nearest mph ←

_____ **or mph**

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Common Units of measurement that you should know:

Length (Customary)	inch (in)	1 in = 2.54 cm
	foot (ft)	1 ft = 12 in
	yard (yd)	1 yd = 3 ft
	mile (mi)	1 mi = 1.6093 km
	mile (mi)	1 mi = 5,280 ft
Length (Metric)	centimeter (cm)	
	meter (m)	1 m = 100 cm
	kilometer (km)	1 km = 1,000 m
Capacity (Customary)	fluid ounce (fl oz)	
	cup (c)	1 c = 8 fl oz
	pint (pt)	1 pt = 2 c
	quart (qt)	1 qt = 2 pt
	gallon (gal)	1 gal = 3.79 L
	gallon (gal)	1 gal = 4 qt
Capacity (Metric)	milliliter (mL)	
	liter (L)	1 L = 1,000 mL
Weight (Customary)	ounce (oz)	
	pound (lb)	1 lb = 16 oz
	pound (lb)	1 lb = .45 kg
	ton (t)	1 t = 2,000 lbs

If you need, use the chart above to do the following problems. Complete 1–4 in a similar method as we did the problem on the front page.

1. 32 in is how many ft? $\frac{32\ in}{1} \bullet \_\_\_\_\_$

2. $\frac{\$27}{hr}$ **is how much $ per min?** $\frac{\$27}{hr} \bullet \_\_\_\_\_$

3. 5 gal is how many cups?

$\frac{5\ gal}{1} \bullet \_\_\_\_\_ \bullet \_\_\_\_\_ \bullet \_\_\_\_\_$

4. A 13 year old student is EXACTLY how many sec?

$\frac{13\ years}{1} \bullet \_\_\_\_\_ \bullet \_\_\_\_\_ \bullet \_\_\_\_\_ \bullet \_\_\_\_\_$