

Dimensional Analysis Review. Use this paper and loose leaf paper as needed. Write BIG, write neat, show ALL UNITS. It's the set up + the thinking that are important. Answers will come out okay if you set up and think properly.

1. You measure your height to be 66.4 inches, but your teacher wants you to convert that using dimensional analysis into your height in MILES. Do a proper set up, cancel all units necessary, get an answer with proper significant figures, and finally convert your answer to scientific notation.

$$\frac{66.4 \cancel{\text{inches}}}{1} \times \frac{1 \cancel{\text{foot}}}{12 \cancel{\text{inches}}} \times \frac{1 \cancel{\text{mile}}}{5280 \cancel{\text{feet}}} = \frac{66.4}{63360} = 1.05 \times 10^{-3} \text{ miles}$$

2. You watched the women's marathon Olympic race and realized your true calling. You too want to run 26.3 miles at once, and get to wear the cute wreath on your head when you win. Convert that distance to millimeters using proper sig figs, then convert it to scientific notation.

$$\frac{26.3 \cancel{\text{miles}}}{1} \times \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mile}}} \times \frac{12 \cancel{\text{in}}}{1 \cancel{\text{ft}}} \times \frac{2.54 \cancel{\text{cm}}}{1 \cancel{\text{in}}} \times \frac{10 \cancel{\text{mm}}}{1 \cancel{\text{cm}}} = 4.23 \times 10^8 \text{ mm}$$

3. A large hole was dug by a person with a bull dozer. It filled up with 379,300 gallons of rain over the past year. How many milliliters of water is that? (0.946 Liters = 1 quart) Convert to scientific notation with proper SF.

$$\frac{379,300 \cancel{\text{gal}}}{1} \times \frac{4 \cancel{\text{Qt}}}{1 \cancel{\text{gallon}}} \times \frac{0.946 \cancel{\text{L}}}{1 \cancel{\text{Qt}}} \times \frac{1000 \cancel{\text{mL}}}{1 \cancel{\text{L}}} = 1.435 \times 10^9 \text{ mL}$$