

“Dimensional Analysis, Fundamental Quantities, Scientific Measurements”

*Directions: Use correct significant figures, and don't forget units!
Show all your work, especially the dimensional analysis.*

Useful information: Speed of Light = 3.0×10^8 m/sec, 1 in = 2.54 cm, 1 kg = 2.2 lbs

1. Distance Conversion. I am 6' 1.5" tall. How tall am I in:
 - a) inches
 - b) meters
 - c) millimeters
 - d) kilometers
 - e) miles
2. Use scientific notation and correct significant figures to represent the following:
 - a) 2,857,239
 - b) 0.0001534
 - c) 432.7×3.1
 - d) $(5.01 \pm .01) \times 3$
 - e) $(5.01 \pm .01) + (34 \pm 1)$
3. Weight. I weigh 198 lbs. How much do I weigh in:
 - a) ounces
 - b) kilograms

c) milligrams

d) troy-ounces (12 troy-ounces = 1 lb)

4. Time. I am 36 years old. How old am I in:

a) days

b) hours

c) minutes

d) seconds

e) heart beats (assume 40 heart beats per minute)

5. Time & Distance. I can run a mile in 5 minutes 30 seconds. How fast could I run:

a) 10 miles

b) 10 kilometers

c) around the equator (remember the definition of a meter!)

6. Fundamental constants. How far does light travel in a year? (Calculate using the speed of light.)

7. Fermi Calculation. How much TV do you watch per day? per week? per year?