

Homework 1

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1 Molecules, ___'s and Oceans

A ___ of water contains about as many molecules as there are ___ s of water in all the Earth's oceans. What word goes in both spaces: drop, teaspoon, cup, quart, gallon, barrel, or ton?

2 Brazen Bank Heist

A couple of thieves managed to break to a bank vault where gold bullion and paper currency (in \$20 bills) is stored. They have to carry the loot on foot for a mile... to maximize their take, what should they take: the gold, or the paper currency?

3 Planck Units

Define Planck units

$$c = \frac{\ell_P}{t_P}, \quad G = \frac{\ell_P^3}{t_P^2 m_P}, \quad \hbar = \frac{m_P \ell_P^2}{t_P}$$

. Solve for the Planck units in terms of fundamental constants. What are the Planck units in cgs units (feel free to look up cgs fundamental constants)?