

ALGEBRAIC MANIPULATION CHALLENGE: What are the Final Units?

In this practice, there is no need to utilize a calculator. The object is to apply your algebra skills to isolate a variable to ultimately determine the final units of the answer.

Solve the following problems using the given FACTS

1. first by identifying any possible equalities,
2. substituting identities of symbols where appropriate and then
3. isolating the variable desired.

Only then may you plug in the data provided to determine the final units.

Problem #1:

FACTS: $\chi = 4.00 \Psi^\circ$ $\chi = \frac{6.00 r}{\theta \alpha^2}$ $\Psi^\circ = \frac{27.0 \rho}{\chi}$

DATA: $r = 0.822 \text{ cm}^3$ $\rho = 1.06 \text{ cm}$ $\chi = 3.011 \text{ g}$ $\theta = 42.3 \text{ g}$

SOLVE FOR α What are the final units?

Problem #2:

FACTS: $\varphi \beta \pi = 3.0 \tau$ $\tau = \frac{8.6 \rho}{\delta}$ $\varphi = \frac{1}{\sqrt{f \Delta}}$ $f = \frac{2.6}{\omega}$ $\pi = \pi$

DATA: $\omega = 2.1 \text{ kg}$ $\beta = 15.01 \frac{\text{kg}}{\text{s}}$ $\delta = 0.60 \text{ m}$ $\rho = 20.0 \text{ kg}$

SOLVE FOR Δ What are the final units?

ANSWERS: 1) $5.54 \times 10^{-2} \text{ cm}$ 2) $0.24 \text{ kgm}^2/\text{s}^2$