

Dimensional Analysis

1. While solving a physics problem a student finds the following relation:

$$\text{velocity} = \sqrt{\text{acceleration} \times \text{height}}$$

What can be said about this result (in terms of dimensional consistency)?

2. What is the correct formula for the surface area of a sphere of radius R ?

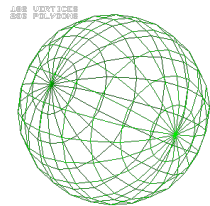
$$2\pi R$$

$$\frac{1}{2}\pi R$$

$$\pi R^2$$

$$4\pi R^2$$

$$\frac{4}{3}\pi R^3$$



3. A student is asked to determine the Period T (time for a complete cycle) of a simple pendulum. He finds two possible equations:

$$T = 2\pi\sqrt{\frac{l}{a}} \qquad T = 2\pi\sqrt{\frac{a}{l}}$$

(1)

(2)

where l is the length of the pendulum and a is an acceleration.

Using dimensional analysis determine which of the two equations is definitely not a possible solution.