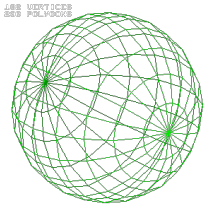
Dimensional Analysis

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?

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



$2\pi R$

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

πR^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.