

**SOLUTIONS**  
**THERMODYNAMICS PRACTICE PROBLEMS FOR NON-TECHNICAL MAJORS**

**Thermodynamic Properties**

1. If an object has a weight of 10 lbf on the moon, what would the same object weigh on Jupiter?

$$g_{\text{Jupiter}} = 75 \frac{\text{ft}}{\text{sec}^2} \quad g_{\text{Moon}} = 5.4 \frac{\text{ft}}{\text{sec}^2} \quad g_c = 32 \frac{\text{lbm-ft}}{\text{lbf-sec}^2}$$

$$|W| = \frac{mg}{g_c} \Rightarrow m = \frac{|W|_{\text{Moon}} g_c}{g_{\text{Moon}}} = \frac{10 \times 32}{5.4} = 59.26 \text{ lbm}$$

$$|W|_{\text{Jupiter}} = \frac{mg_{\text{Jupiter}}}{g_c} = \frac{59.26 \times 75}{32} = \boxed{139 \text{ lbf}}$$

2. An object that weighs 50 lbf on earth is moved to Saturn where its new weight is 105 lbf. What is the acceleration due to gravity on Saturn?

$$g_{\text{Earth}} = 32 \frac{\text{ft}}{\text{sec}^2} \quad g_c = 32 \frac{\text{lbm-ft}}{\text{lbf-sec}^2}$$

$$50 \text{ lbf on earth} \Rightarrow 50 \text{ lbm}$$

$$|W| = \frac{mg}{g_c} \Rightarrow g = \frac{|W| g_c}{m} = \frac{105 \times 32}{50} = \boxed{67.2 \frac{\text{ft}}{\text{sec}^2}}$$

3. Define, using equations, specific volume ( $v$ ) and density ( $\rho$ ). What is the mathematical relationship between these two terms?

$$v = \frac{V}{m}, \quad \rho = \frac{m}{V}, \quad v = \frac{1}{\rho} \text{ or } \rho = \frac{1}{v}$$

**Temperature and Pressure Measurements**

4. (a) Define temperature.  
(b) What is the absolute temperature scale corresponding to Fahrenheit?  
(c) Convert 100° F to that absolute scale.

(a) Temperature: a measure of molecular activity of a substance.

(b) Rankine

(c) °R = °F + 460  $\Rightarrow$  100° F converts to 560° R

# Thermodynamics Sample Problems With Solutions

**Thomas Griffiths**



## **Thermodynamics Sample Problems With Solutions:**

## **Thermodynamics Sample Problems With Solutions** Book Review: Unveiling the Power of Words

In some sort of driven by information and connectivity, the ability of words has be evident than ever. They have the capacity to inspire, provoke, and ignite change. Such could be the essence of the book **Thermodynamics Sample Problems With Solutions**, a literary masterpiece that delves deep to the significance of words and their effect on our lives. Written by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we shall explore the book is key themes, examine its writing style, and analyze its overall impact on readers.

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