

Please print this sheet and complete your work on it. Also show all your calculations / work.

Ch. 7 Sp. Topics problems are due on: Monday, November 25 by 09:25 a.m. MST

1. Compute the speed of sound waves in air when the temperature is: 32 °F.

$$T = \text{_____} \text{ } ^\circ\text{C}$$

$$T = \text{_____} \text{ } K$$

$$\sqrt{\frac{(1.40) * (8.314) * (T_{\text{Kelvin}})}{28.8 \times 10^{-3}}}$$

$$\text{Speed of sound} = \text{_____} \text{ } m/s$$

2. Find the Force the Moon exerts on Planet Earth.

Assume the Mass of the Moon is:

$$8 \times 10^{20} \text{ } kg$$

Assume the Mass of Planet Earth is:

$$6 \times 10^{22} \text{ } kg$$

Mean radius between the two celestial bodies:

$$378,000,000 \text{ } m$$

3. A Volvo Truck traveling at: 96 km/hr approaches and passes a stationary person standing along the highway & the driver sounds the horn. If the horn has a frequency of: 400 Hz, what are the “frequencies” of the sound waves heard by the person?

Velocity of truck = v_{source}

frequency of horn = f_{source}

Speed of sound $v_{sound} = 346 \text{ m/s}$

a. 96 km/h = _____ m/s

- b. What is the frequency of the sound waves heard by the person as the truck approaches?

$$f_{frequency} = [v_{sound} / (v_{sound} - v_{source})] f_{source}$$

- c. What is the frequency of the sound waves heard by the person after the truck has passed by?

$$f_{frequency} = [v_{sound} / (v_{sound} + v_{source})] f_{source}$$