

PHYSICS 151 READING ASSIGNMENT

FOR JULY 22

SECTIONS 13.1 TO 13.5, 14.1 TO 14.4

Please notice that this file is three pages long.

13.1 Fluids and Density

- Hopefully, you've seen density before.
- A gas's density can change because it can be compressed. Liquids and solids, on the other hand, have a constant density.

13.2 Pressure

- This section explains the famous phenomena that the pressure in a liquid increases with depth.
- Make sure to check out the examples here. They'll give you a good idea of how to apply the pressure equation.
- The same basic idea applies to gases too, so now you understand why the atmospheric pressure is less in Albuquerque than at sea level!
- The blood-pressure section should be familiar, but hopefully makes sense.

13.3 Measuring and Using Pressure

- More good examples on how to apply the pressure equation. (And it explains how a barometer works!)

13.4 Buoyancy

- Buoyancy - The upwards force exerted by a fluid.
- The buoyant force depends on the density of the fluid.
- This section also has the famous result about how density determines whether an object will sink or float.

13.5 Fluid in Motion

- We'll do just the very basics of this section. We'll define terms and discuss the continuity equation. The rest you can read on your own.

13.6 and 13.7

- Lots of good but hard stuff here. Feel free to read for your own enjoyment!

14.1 - Equilibrium and Oscillation

- This section reintroduces and generalizes the idea of frequency and period.
- Period, T - Time for one cycle.
- Frequency, f - Number of cycles per time.
- $f = 1/T$, just like in circular motion.

14.2 - Simple Harmonic Motion

- Simple Harmonic Motion - Oscillation of a mass connected to a spring with no friction or a pendulum.
- Amplitude, A - maximum distance from equilibrium.
- Note: In lecture, I will go all the way through the mass on a spring and then come back and do the pendulum.

14.3 - Describing Simple Harmonic Motion

- Being able to determine the period and frequency from a position-versus-time graph is very important.
- Velocity-versus-time and acceleration-versus-time graphs are good to know but not essential.
- I won't require you to use most of the equations from this section (v_{max} and a_{max} particularly), but they may come in helpful in other classes.

14.4 - Energy in Simple Harmonic Motion

- For my class, the most important part of this section is the equation for the period.
- $T = 2\pi\sqrt{\frac{m}{k}} \Rightarrow$ the mass and spring completely determine the period of simple harmonic motion. The starting conditions, especially amplitude, have no effect on period.