

Chapters 6-8 Test description

The Chapter 6-8 Test will be on Wednesday April 7 at 6:30 to 7:45pm. Please read the instructions for tests carefully so you are well prepared. Please note that labs will occur as usual that day.

A "sample test" will be posted in Files/Tests on Canvas. The sample test does NOT necessarily include all of the material you need to know; it is for practice taking a test in a test setting. Anything covered in the homeworks, lectures, or in-class activities is fair game. The test will consist of a mixture of calculation problems (like "standard problems"), conceptual problems, and miscellaneous problems like problems involving graphing.

This test covers chapters 6-8 and the associated homeworks. You should know:

- The shortcuts for calculating work and when to apply them.
- How to apply the work-energy theorem.
- How to find the power in various situations.
- How energy is transformed and transferred, and the role work plays in this.
- How potential energy is defined when a conservative force is present.
- How to solve conservation of energy problems.
- How impulse and momentum are related.
- How to solve 1D conservation of momentum problems including collisions and explosions.
- The relationships between energy, momentum, work, and impulse.

You should also know the material from the previous tests:

- The meanings of the metric prefixes n, μ , m, c, k, and M.
- The definitions and relationships between position, displacement, distance, velocity, speed, and acceleration in 1D.
- How to calculate instantaneous and average velocities off an x vs. t graph and accelerations off a v vs. t graph.
- How x vs. t and v vs. t graphs correspond to actual motion, and what graphs of constant acceleration and constant velocity motion look like.
- How to solve 1D kinematics problems, including using calculus techniques and problems with multiple objects and/or time intervals.
- How to add and subtract vectors graphically.
- How to find the components of vectors.
- How to use vector components to find the magnitude and direction of vectors.
- How to solve 2D kinematics problems including, but not restricted to, projectile motion.
- Radial and tangential acceleration, and how they affect objects in motion.
- The concepts related to describing circular motion
- Newton's 3 laws of motion and how they apply to various situations. You must know which law is which.

- How to draw a free body diagram.
- How to solve Newton's second law problems including:
 - Problems involving friction.
 - Problems involving tension.
 - Problems involving multiple interacting objects.
 - Problems involving taking vector components.
 - Problems involving using tilted coordinate axes.
 - Problems involving circular motion.
- The meaning of apparent weight.