

Unit 2: Two-Dimensional Motion

Text:Chapter 3: *(This is a review of the math you need to be able to do.)*

Chapter 4:

Questions (p. 76-77): 2, 6, 9, 10, 12

Problems (p. 77-86):

#1: equations of motion, vector form: 1, 5, 6, 10, 17, 20

#2: uniform circular motion: 57, 59, 62, 63, 66, 68

#3: relative motion: 69, 70, 76, 78, 79

#4: projectile motion 1: 21, 23, 24, 26, 27, 29, 30

#5: projectile motion 2: 35, 39, 42, 44, 50, 52

Vocabulary:

vector, scalar, component, unit vector, magnitude, direction, resultant vector, centripetal acceleration, reference frame, inertial reference frame, range

Math:

definitions: no new definitions

derived formulas:

$$a_c = \frac{v^2}{r} \qquad R = \frac{v^2 \sin 2\theta}{g}$$

skills: right triangle trigonometry

Key Objectives:

- be able to convert vectors between unit-vector form, component form, graphical form and magnitude/direction.
- be able to add and subtract vectors in any form.
- be able to apply the equations of motion to vectors.
- be able to solve a variety of word problems concerning projectile motion, circular motion, and relative motion.
- be able to describe what happens to position, velocity and acceleration for projectiles.
- be able to describe the effects of air resistance on a projectile.
- be able to describe what happens to position, velocity and acceleration for an object that is traveling in a circle (at both constant speed and varying speed.)
- be able to sketch vectors representing position, velocity and acceleration for any given situation.
- given sketches of the paths of projectiles, be able to make qualitative statements comparing the projectiles (e.g. which projectile was in the air the longest)