Textbook Practice Questions:

**1.7.** Which of the following equations are dimensionally correct? (a) *vf* = *vi* + *ax*

(b) *y* = (2 m)cos(*kx*), where *k* = 2 m–1.

**1.26.** The radius of a solid sphere is measured to be (6.50 ± 0.20) cm, and its mass is measured to be (1.85 ± 0.02) kg. Determine the density of the sphere in kilograms per cubic meter and the uncertainty in the density.

**1. 44.** Vector  has *x* and *y* components of –8.70 cm and 15.0 cm, respectively; vector  has *x* and *y* components of 13.2 cm and –6.60 cm, respectively. If , what are the components of ?

**2. 12.** An object moves along the *x* axis according to the equation *x*(*t*) = (3.00*t*2 – 2.00*t* + 3.00) m, where *t* is in seconds. Determine (a) the average speed between *t* = 2.00 s and *t* = 3.00 s, (b) the instantaneous speed at *t* = 2.00 s and at *t* = 3.00 s, (c) the average acceleration between *t* = 2.00 s and *t* = 3.00 s, and (d) the instantaneous acceleration at *t* = 2.00 s and *t* = 3.00 s.

**2. 25.** A truck on a straight road starts from rest, accelerating at 2.00 m/s2 until it reaches a speed of 20.0 m/s. Then the truck travels for 20.0 s at constant speed until the brakes are applied, stopping the truck in a uniform manner in an additional 5.00 s. (a) How long is the truck in motion? (b) What is the average velocity of the truck for the motion described?

**2. 55.** A rock is dropped from rest into a well. The sound of the splash is heard 2.40 s after the rock is released from rest. How far below the top of the well is the surface of the water? The speed of sound in air (at the ambient temperature) is 336 m/s.