CHAPTER 3

1. An object traveling at a velocity of 30 m/s accelerates uniformly to a speed of 45 m/s in a time of 12 seconds.
a. What is the acceleration of the object?
b. How much distance did it travel during the 12 seconds?

2. An object traveling at a velocity of 20 m/s accelerates uniformly to a speed of 50 m/s in a distance of 12 m.
a. What is the acceleration of the object?
b. How much time did it take to reach the final velocity?

3. A ball is thrown straight down into a well at a speed of 12 m/s and it hits the water at the bottom of the well 2.3 seconds later.
a. Determine the depth of the well.
b. Calculate the speed of the ball when it hit the water.

4. A ball is thrown vertically upwards from a height of 70 m with an initial speed of 45 m/s.
a. What is the maximum height that the ball reaches?
a. What will its speed be just before it hits the ground?
b. How long will it take the ball to reach the ground?

5. A person driving at 120 mph (166 ft/s) applies the brakes. The magnitude of the deceleration of the brakes is 23 ft/s^2.
a. How fast in ft/s is the car going 2 seconds later? Convert this answer to mph.
b. What distance does the car travel before it stops? Convert this answer to miles.
c. How much time does it take to stop after hitting the brakes?

6. A ball is thrown straight down into a well at a speed of 15 m/s and it hits the water at the bottom of the well 3.7 seconds later.
a. Determine the depth of the well.
b. Calculate the speed of the ball when it hit the water.

7. A ball is thrown vertically upwards with an initial speed of 20 m/s.
a. What is the maximum height that the ball reaches?
a. What will its speed be just before it hits the ground?

b. How long will it take the ball to reach the ground?

8. A person driving at 90 mph (132 ft/s) applies the brakes. The magnitude of the deceleration of the brakes is 22 ft/s^2.

a. How fast in ft/s is the car going 3 seconds later? Convert this answer to mph.
b. How much time does it take to stop after hitting the brakes?
c. What distance does the car travel before it stops? Convert this answer to miles.

9. Vector **A** = 22**i** +4**j.** Vector **B** = 5**i** - 10**j**.

a. Calculate the magnitude and direction of **A** + **B**.
b. Calculate the magnitude and direction of **A - B**.
c. Calculate **A**·**B** (dot product)
d. Calculate **AxB** (component notation)
