

## Homework 5

Due: Friday, February 18, 2011

**Note:** In what follows, numbers in parentheses indicate the problem numbers for users of the sixth edition. A \* indicates that you this problem is not in the sixth edition and you should look in the Michigan edition.

**Section 15.1**, pg. 933: 16 (14), 32, 53–58(\*), 60 (62).

**Section 15.2**, pg. 944: 6 (\*), 8 (10), 28 (30), 36 (38).

**Section 15.3**, pg. 955: 32 (36), 44 (48), 64 (68), 77 (81), 83 (87).

**Section 15.4**, pg. 966: 4, 14, 18 (20), 36 (38).

**Additional Problem:**

1. Dave is riding the “corkscrew roller-coaster in an amusement park. He has a photo camera and wants to take a picture of his girlfriend who is waiting for him on the ground at the point  $P(12, 8, 11)$ . Because of the restraints, Dave can only hold the camera looking forward, and can take pictures only in the direction of the motion of the roller-coaster. The motion of Dave as a function of time  $t$  is given by

$$\begin{aligned}x_D(t) &= t^2, \\y_D(t) &= 2t, \\z_D(t) &= 3t - 1.\end{aligned}$$

Find the moment at which Dave has to take the picture of his girlfriend.

2. Read about the Cobb-Douglas Production Function on page 954. Suppose your company has a production function given by  $P(L, K) = L^\alpha K^{2-\alpha}$  for some number  $0 < \alpha < 2$ . Is your company in good shape? What is the best course of action you should take (in terms of increasing or decreasing labor and/or capital)?