

## Problem Set Five

### Exercises

7.3: **1,4,8,35**

7.4: 6,7,9,14,**21,22,26,27**

7.5: 7,**9,12,15**,

7.7: **1, 6, 11,12,15,22,25**, 31,33,**35,36**,57,**60**

### Problems

Suppose that among a population of 100 male and 80 female swans, the rate at which couples are formed is proportional to the product of the number of available males and available females. Since the number of available males is 100 minus the number  $c$  of couples, we get

$$dc/dt = k(100 - c)(80 - c)$$

where  $k$  is a positive constant, and  $t$  is the time in days.

Using separation of variables and partial fractions, solve for the number of couples as a function of time. Graph your answer.

(b) Solve for the number of couples as a function of time, if the number of female and male swans are both 100.