

Homework 7

Additional problems
due October 21, 2014

In addition to

3.3: 2, 6, 10, 14, 16, 26, 32, 42, 46, 48, 56, 60, 82

3.4: 2, 16, 28, 46, 56, 73

3.5: 2, 12, 24, 38, 39, 40

complete the following problems.

Note: Limits as $x \rightarrow \infty$ is an important concept - there are lots more problems in 3.3 for you to practice practice practice!

1. “Good Fences make Good Neighbors” A fence of length 100 ft is to be used to enclose two gardens. One garden is to have a circular shape, and the other to be square. Find out how the fence should be cut so that the sum of the areas inside both gardens is as large as possible.

2. Drug doses and sensitivity The *reaction* $R(x)$ of a patient to a drug dose of size x depends on the type of drug. For a certain drug, it was determined that a good description of the relationship is:

$$R(x) = Ax^2(B - x),$$

where A and B are positive constants. The *sensitivity* of the patient’s body to the drug is defined to be $R'(x)$.

(a) For what value of x is the *reaction* a maximum, and what is that maximum reaction value?

(b) For what value of x is the *sensitivity* a maximum? What is the maximum sensitivity?