

# Homework 7

due March 17, 2014

In addition to

**11.1** 5, 11, 15, 17, 21, 24, 25, 29, 31, 32, 33, 40, 41, 45, 49, 67, 73, 74, 76, 90

**11.2** 5, 11, 12, 15, 18, 19, 22, 24, 27, 30, 31, 34, 40, 42, 46, 48, 50, 53, 57, 64, 70, 72, 83, 84, 85

complete the following problem.

**Challenge problem.** A sequence of ants walk from  $(0,0)$  to  $(1,0)$  in the plane. The  $n^{\text{th}}$  ant walks along  $n$  semicircles of radius  $1/n$  with diameters lying along the line from  $(0,0)$  to  $(1,0)$ . Let  $L_n$  be the length of the path walked by the  $n$ th ant. Compute  $\lim_{n \rightarrow \infty} L_n$ .