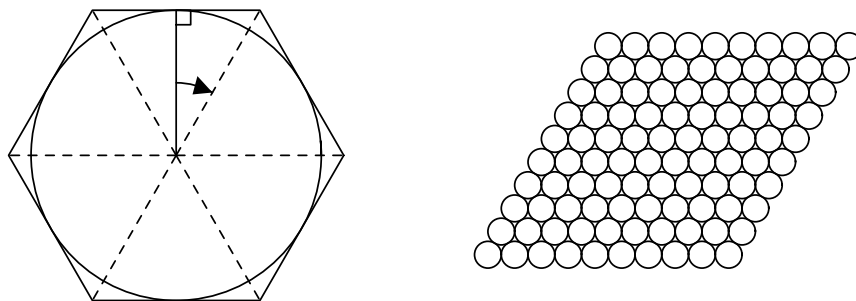


HOMEWORK (winter/spring)–Week 9

1. Stewart, section 4.5: # 9, 14, 33, 49,
2. Stewart, section 4.7: #25, 29, 31, 37, 66, 69.
3. Cylindrical cans with circular tops and bottoms are to be manufactured to contain a given volume. There is no waste involved in cutting the tin that goes into the vertical side of the can. But the two circular end pieces are cut from a sheet, as shown at the bottom of the page. If the circles for the tops and bottoms of the cans are fit as snugly as possible, each uses up a hexagonal area of tin, as shown in the picture above. First find the area of one of the hexagons in terms of r . (Hint: It consists of 6 equal equilateral triangles.) Now find the ratio of height to radius for the most economical cans. In other words, minimize the total area of tin needed to make a can.



4. A farmer has 136 meters of fencing. She wants to make two rectangular enclosures. One will be square. The other will have its long side twice as long as its short side. (Allow the possibility that all of the fencing could go to only one of the enclosures.)
 - (a) What should the dimensions of the enclosures be to make the combined total area of the enclosures as **small** as possible?
 - (b) What should the dimensions of the enclosures be to make the combined total area of the enclosures as **large** as possible?