Project 5.

Consider the sequence of polygons approximating the semi circle shown in figure 1, built of 1, 2, 4, 8 line segments, respectively. a) Compute the length

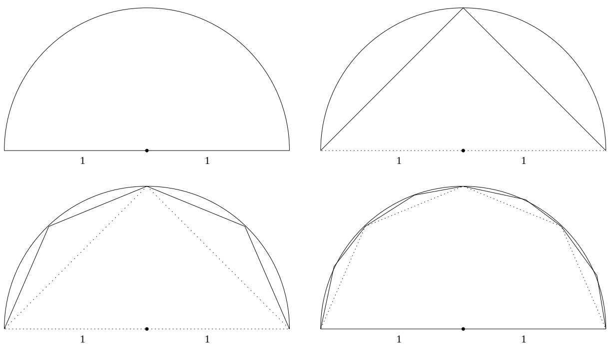

Figure 1:

of these polygons. b) For a polygon of this form with n line segments and of length s_n, find the length s_{2n} of the next polygon with $2n$ line segments. Hint: see figure 2.

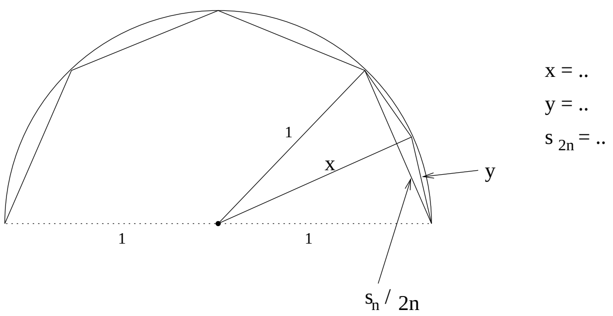

Figure 2:

Use the formulas for obtaining s_{2n} from s_n repeatedly, starting from $s_1 = 2$, to get a good approximation of the length s of the semi circle. Probably, you would like to use matlab (or your high school calculator) for this purpose. Hint: the square root of x is denoted $sqrt(x)$ in matlab.