D*. Please solve the following problems; display the computations, and upload the resulting pdf document on the appropriate Canvas assignment link:

The diameter of flat metal disk manufactured by a factory is a random number between 4 and 4.5. What is the probability that the area of such a flat disk chosen at random is at least 4.41π ?

Sample computation:

Let D = the diameter of the metal disk selected at random. D is a random variable and the area of the metal disk is $\pi \cdot (D/2)^2$. Note that $\pi \cdot (D/2)^2$ is another random variable. We want to calculate the probability of the event $\pi D^2/4 > 4.41\pi$:

$$p(\frac{\pi D^2}{4} > 4.41\pi) = p(D^2 > 17.64) = p(D > 4.2).$$

Now to calculate $p(D > 4.2)$:

Note that since $D \in (4, 4.5)$ selected randomly, the probability that

$D \in (4.2, 4.5)$ is $(4.5 - 4.2)/(4.5 - 4) = 3/5$. Hence, $p(\frac{\pi D^2}{4} > 4.41\pi) = 3/5.$