**Roses** are regions defined in polar coordinates as \( \{(\theta, r) \mid 0 \leq r \leq f(\theta)\} \), where \( f(\theta) \) is a periodic function of \( \theta \). The picture above to the right for example shows a rose defined by

\[
f(\theta) = |\cos(4\theta) + \sin(11\theta)/5|.
\]

1) The area of a rose is \( \int_0^{2\pi} \int_0^{f(\theta)} 1 \, dr \, d\theta \).

2) Write down a single integral for the area of the rose.

3) Calculate the area of the rose defined by \( f(\theta) = |\cos(5\theta)| \) (Use \( \cos^2(\theta) = (\cos(2\theta) + 1)/2 \)).