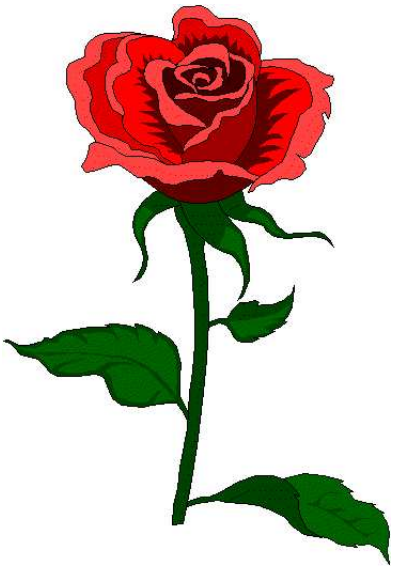
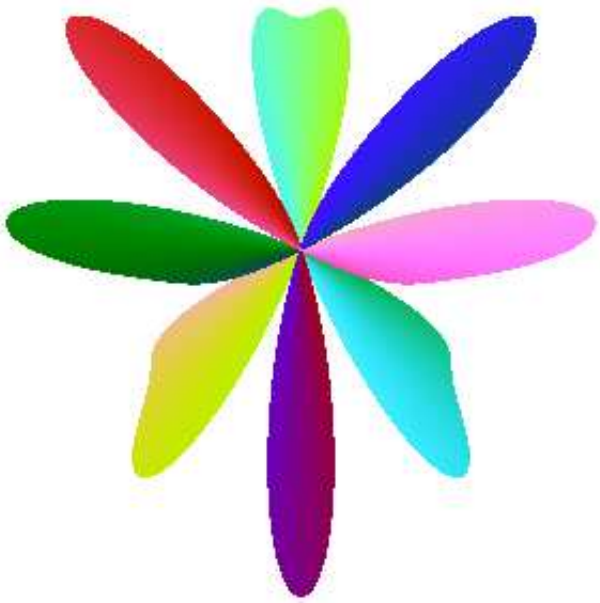
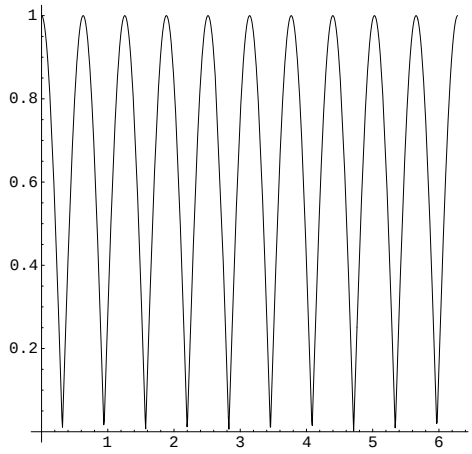


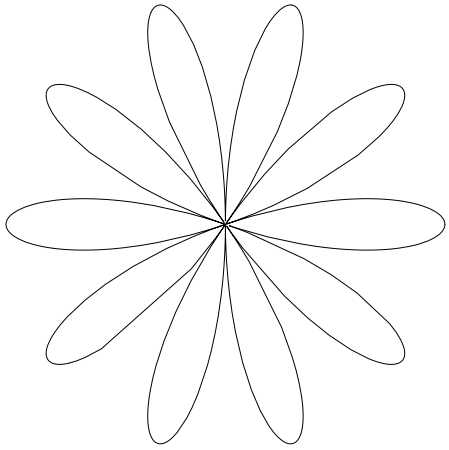


Roses are regions defined in polar coordinates as $\{(\theta, r) \mid 0 \leq r \leq g(\theta)\}$, where $g(\theta)$ is a periodic function of θ. The picture above to the right for example shows a rose defined by

$$g(\theta) = |\cos(4t) + \sin(11t)/5| \ .$$



Graph of $g(\theta) = |\cos(5\theta)|$.



The corresponding rose.

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

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

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