Preface

Here are a set of problems for my Calculus I notes. These problems do not have any solutions available on this site. These are intended mostly for instructors who might want a set of problems to assign for turning in. I try to put up both practice problems (with solutions available) and these problems at the same time so that both will be available to anyone who wishes to use them.

**Area with Polar Coordinates**

1. Find the area inside the inner loop of $r = 3 + 10 \sin \theta$.
2. Find the area inside the inner loop of $r = 5 + 12 \cos \theta$.
3. Find the area inside the graph of $r = 8 + \cos \theta$ and to the right of the $y$-axis.
4. Find the area inside the graph of $r = 5 - 4 \sin \theta$ and the below the $x$-axis.
5. Find the area that is inside $r = 4$ and outside $r = 4 - 2 \sin \theta$.
6. Find the area that is inside $r = 7 - 3 \cos \theta$ and outside $r = 4$.
7. Find the area that is inside $r = 6 + 6 \cos \theta$ and outside $r = 4 - 3 \cos \theta$.
8. Find the area that is inside $r = 4 + 2 \sin \theta$ and outside $r = 5 - \sin \theta$.
9. Find the area that is inside $r = 5 - \sin \theta$ and outside $r = 4 + 2 \sin \theta$.
10. Find the area that is inside both $r = 6 - 4 \sin \theta$ and $r = 5$.
11. Find the area that is inside both $r = 3 + 2 \cos \theta$ and $r = 3 - \cos \theta$. 