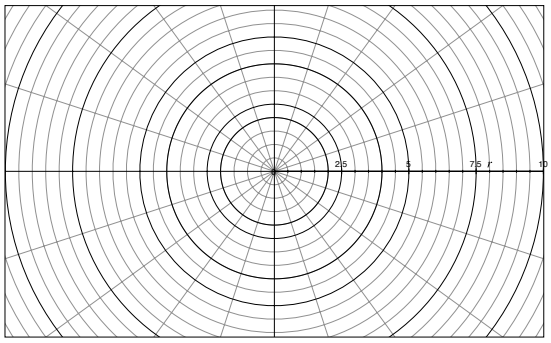
East Los Angeles College
Department of Mathematics
Math 262
Test 4-Take Home

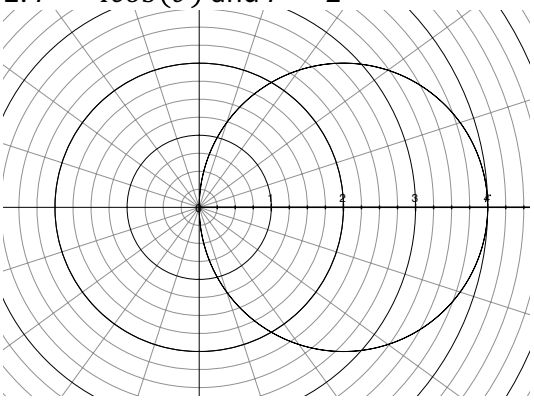
Show your work for credit.

Determine the area inside the first curve and outside the second curve.

1. $r = 4$ and $r = 2$

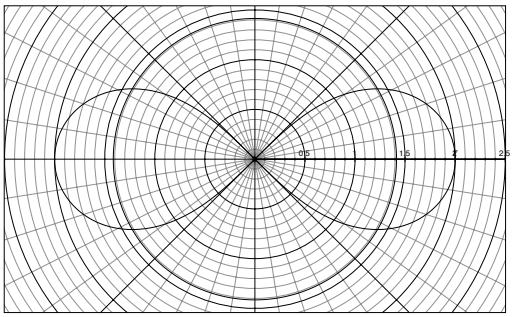


2. $r = 4cos(\vartheta)$ and $r = 2$



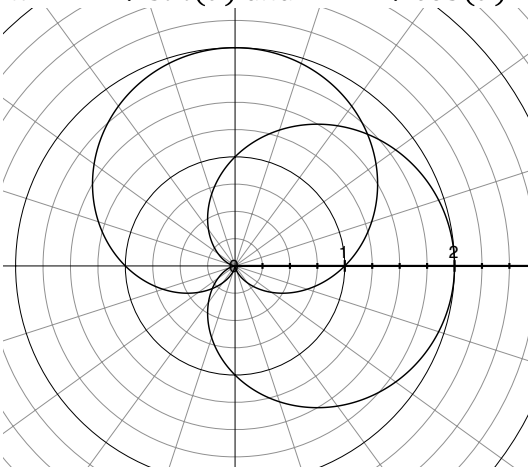
3. $r^2 = 4cos(2\theta)$ and $r = \sqrt{2}$

Hint- Use symmetry

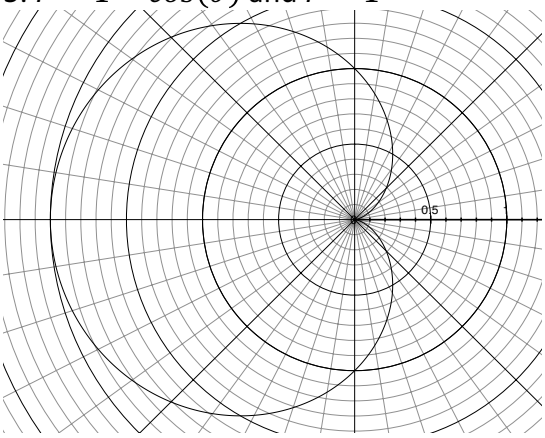


Determine the area inside both curves.

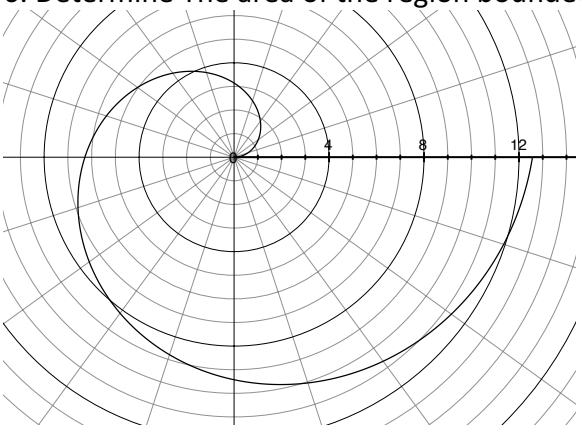
4. $r = 1 + sin(\theta)$ and $r = 1 + cos(\theta)$



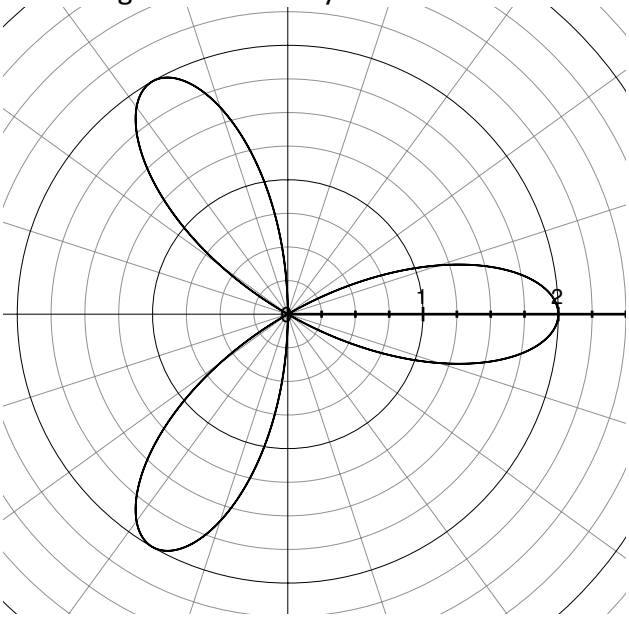
5. $r = 1 - cos(\theta)$ and $r = 1$



6. Determine The area of the region bounded by the spiral $r = 2\theta$ for $0 \leq \theta \leq \pi$ and the x-axis.



7. The region bounded by all leaves of the rose $r = 2cos(3\theta)$



Determine the limits of the following sequences.

8. $\left\{\frac{3n^3}{n^3+1}\right\}$

9. $\{e^{-n}n^{10}\}$

10. $\left\{\left(\frac{5+n}{n}\right)^n\right\}$

11. $\left\{\frac{n^4}{n^4+1}\right\}$

12. $\left\{\frac{(-1)^n n^4}{n^4+1}\right\}$

13. $\left\{\frac{cos(n)}{n^2+1}\right\}$

Determine whether the series converges or diverges.

14. $\sum_{k=0}^{\infty} \left(\frac{e}{\pi}\right)^k$

15. $\sum_{k=0}^{\infty} \left(-\frac{3}{4}\right)^k$

16. $\sum_{k=1}^{\infty} \frac{2^{k-1}}{3^{k+1}}$

Determine whether the following telescoping series converge or diverge. Show your work by computing the sequence of partial sums.

17. $\sum_{k=1}^{\infty}\left(\frac{1}{k+1}-\frac{1}{k+2}\right)$

18. $\sum_{k=1}^{\infty}\left(\sqrt{k+1}-\sqrt{k}\right)$