

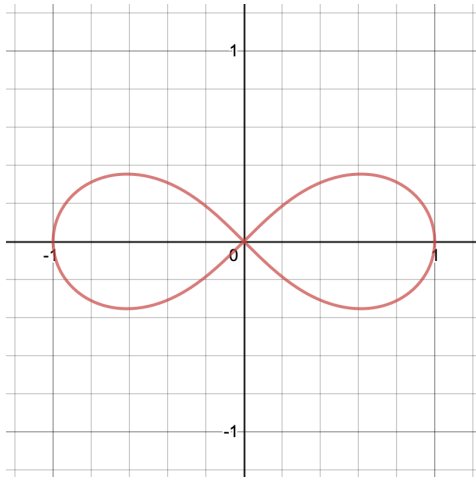
East Los Angeles College
Department of Mathematics
Math 262
Final Exam

Show Work for Credit

1. Determine points on the curve where the tangent is horizontal.

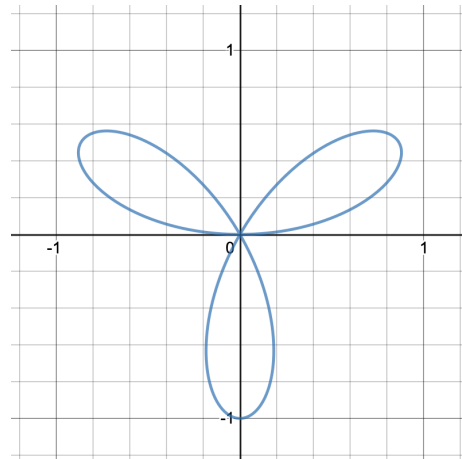
$$r^2 = \cos(2\theta)$$

Hint- Use Implicit Differentiation



2. Determine the area enclosed by one loop of the 3-leaf rose.

$$r = \sin(3\theta)$$



3. Find the arc length of the curve $y = \frac{1}{3}x^{3/2} - x^{1/2}$ for $2 \leq x \leq 8$.

4. The curve $y = x^3$ for $0 \leq x \leq 2$ is rotated. Find the area of the resulting surface, if the curve is rotated about the x-axis.

Find the sum of the series.

5. $1 - e + \frac{e^2}{2!} - \frac{e^3}{3!} + \dots$

6. $\sum_{n=1}^{\infty} [\tan^{-1}(n+1) - \tan^{-1}(n)]$

Hint- This is a Telescoping Series.

Determine whether the series is convergent or divergent. No guessing and justify your answer.

7. $\sum_{n=1}^{\infty} \frac{n-1}{2n+1}$

8. $\sum_{n=1}^{\infty} (-1)^n \frac{n^3}{n^4+1}$

9. $\sum_{n=1}^{\infty} \frac{1}{2+3^n}$

10. $\sum_{n=1}^{\infty} \frac{2^n}{n!}$

Determine the interval of convergence for the following power series.

11. $\sum_{n=0}^{\infty} \sqrt{n}(x-1)^n$

12. $\sum_{n=1}^{\infty} \frac{(-1)^n n^2 x^n}{2^n}$

Find the Maclaurin series expansion for the following functions.

13. $f(x) = \frac{x}{4+x^2}$

14. $f(x) = xe^{-2x}$

Determine the first three terms for the following functions written as power series.

15. $f(x) = e^x \cos(x)$