Present neatly ~~on separate paper~~. Justify for full credit. No Calculators.

Name _____ Score _____ A (25 minutes) **x10**

1) For which values of t is the curve concave upward? Concave downward?

$$x = 2 \sin t, \quad y = 3 \cos t, \quad 0 < t < 2\pi$$

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2) Find the points on the curve where the tangent is horizontal or vertical.

$$x = \cos \theta, \quad y = \cos 3\theta$$

---

3)

Find the area of the region that lies inside the curve $r = 2 + \cos 2\theta$ but outside the curve $r = 2 + \sin \theta$.

4) Determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} n \sin(1/n)$$

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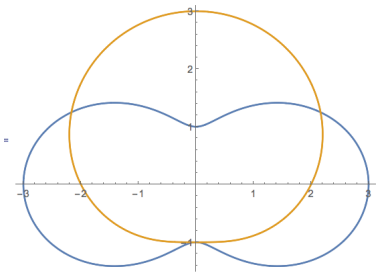
5) Find the Maclaurin series and the radius of convergence.

$$f(x) = 10^x$$

Graph for Problem 3



Present neatly ~~on separate paper~~. Justify for full credit. No Calculators.

Name _____ Score _____ F (25 minutes) **x10**

1) For which values of t is the curve concave upward? Concave downward?

$$x = \cos 2t, \quad y = \cos t, \quad 0 < t < \pi$$

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2) Find the points on the curve where the tangent is horizontal or vertical.

$$x = e^{\sin\theta}, \quad y = e^{\cos\theta}$$

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3)

Find the area of the region that lies inside both of the circles $r = 2 \sin\theta$ and $r = \sin\theta + \cos\theta$.

4) Determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \frac{e^{1/n}}{n^2}$$

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5) Find the Maclaurin series and the radius of convergence.

$$f(x) = \ln(4 - x)$$

Graph for Problem 3: