

Math 252
Exam III

Name

"I love math because there's always a
right answer...That's not always true in
life." --Emery Lord

1 (16 Points) Find the Maclaurin series for each of the following functions:

(a) $(x^2+1)^{-1}$

(b) $\cos(3x^4)$

2 (14 Points). Find the first three terms in the Maclaurin Series expansion of $\sqrt{1+8x}$.

3 (10 Points). Graph the polar function $r=3+3\cos(\theta)$. A bald answer is allowed but be sure to put markings on both axis to indicate proper length.

4 (15 Points). Find the arc-length of the segment described below:

$$x = 1 - 4e^{\frac{t}{2}}$$

$$y = t - e^t$$

$$0 \leq t \leq 1$$

5 (15 Points). What is the area of the region both inside $r=2\sin(\theta)$ and outside $r=1$?

6 (15 Points). Graph $x^2+8y+9=6x$. Label the vertex, focus and directrix.

7 (15 Points). Graph the following:

$$x=t^2+1$$

$$y=t^4+1$$

$$-1 \leq t \leq 1$$