EXAM 4 - MATH 152 Friday, November 30

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the radius and the interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{(-2)^n}{\sqrt{n}}(x+3)^n$.

2. Use decomposition into partial fractions to obtain a power series for the function $f(x) = \frac{7x-1}{3x^2+2x-1}$.

3. Consider the parametric equations $\begin{cases} x &= \cos\theta + \sin 2\theta \\ y &= \sin\theta + \cos 2\theta \end{cases}$ Find an equation to the tangent of the parametric curve at $\theta = 0$.

4. Find the length of the parametric curve $\begin{cases} x &= e^t - t \\ y &= 4e^{t/2} \end{cases}$ for $-8 \leq t \leq 3$.

5. Identify the polar curve $r = 2\sin\theta + 2\cos\theta$ by finding a Cartesian equation for the curve.