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Sign Your Name: _____

Please clearly organize your work, show all steps, simplify all answers, and BOX your answers.

1. (3 points) Find the interval I and radius R of convergence of the given power series. For the interval of convergence, give your answer using interval notation or using inequality notation.

$$\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{\sqrt{n}}$$

$I =$

$R =$

2. (3 points) Find the Taylor series expansion of $f(x)$ at $x = 0$ for the given function. If you use a known (common) Taylor series, please carefully state the known series that you are using as part of your work.

$$f(x) = x^2 e^{3x}$$

$f(x) =$

3. (6 points) Determine if the given alternating series converges absolutely, converges conditionally, or diverges.

(a)
$$\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n^2 + 1}}$$

(b)
$$\sum_{n=2}^{\infty} \frac{(-1)^n 3n}{\ln n}$$