Recommended problems from book: 3-10, 11, 13, 15, 17, 27, 29.
In problems 1-3, find a power series representing the function. Determine the interval of convergence of each series.

1. \[ \frac{1}{1 - 3x} \]

2. \[ \frac{x}{1 + 4x^2} \]

3. \[ \arctan(x^2) \]

4. Find a power series for an antiderivative for \[ \arctan(x^2) \].

Estimate \[ \int_0^{\frac{1}{2}} \arctan(x^2) \, dx \] within five decimal places using a partial sum of this series. (hint: the series you get for this will be an alternating series, as in the example in the book).