# 9.5 Power Series Group Work Target Practice

$$\sum_{n=1}^{\infty} \frac{(5x)^n}{n} = 5x + \frac{25x^2}{2} + \frac{125x^3}{3} + \dots$$

1. What is the center, the value of $x$ that makes this power series 0 and hence gives convergence?

   A power series always converges at the center, and we look to see how far away from it we can go to still converge. For a power series, either geometric series tests or the ratio test is helpful to find the radius and interval of convergence.

2. Is the series geometric?

3. Use the ratio test, where we look at the ratio of successive terms to see if it is bounded (convergence for $L < 1$) or unbounded (divergence for $L > 1$). The test fails if $L = 1$.

   $$L = \lim_{n \to \infty} \frac{|a_{n+1}|}{|a_n|} =$$

4. What is the radius of convergence $R$?

5. Write the open interval about the center where the power series converges.

6. To find the interval of convergence, first check the left endpoint. Write the series given by the left endpoint and check whether that series converges or diverges:

7. Next check the right endpoint. Write the series given by the right endpoint and check whether that series converges or diverges:

8. Write the interval of convergence: