5. [10 points] Consider the Taylor series:

$$\sum_{n=1}^{\infty} \frac{9n^2+8}{2^n \cdot (n^3+1)} (x+3)^n,$$

a. [1 point] Determine the center, a, of the Taylor series.

Answer: $a =$ _____

b. [9 points] The radius of convergence of the Taylor series is 2 (you do **not** need to show this). Determine the interval of convergence of the Taylor series. Show all your work, including full justification for series behavior.

Answer: The interval of convergence is _____