

3. [10 points] The Taylor series centered at 3 for a function  $g(x)$  is given by

$$\sum_{n=1}^{\infty} \frac{(-1)^n (x-3)^{2n}}{n 4^n}.$$

- a. [5 points] Determine the radius of convergence for this Taylor series. Show all work.

**Radius:** \_\_\_\_\_

- b. [2 points] Which of the following best describes the concavity of  $g(x)$  at  $x = 3$ ? Circle the one best answer. No justification is necessary.

CONCAVE UP    CONCAVE DOWN    NEITHER    CANNOT BE DETERMINED

- c. [3 points] Find  $g^{(1010)}(3)$ .

$$g^{(1010)}(3) = \underline{\hspace{10cm}}$$