12. [8 points] Suppose that the power series $\sum_{n=0}^{\infty} a_n(x-4)^n$ converges when $x = 0$ and diverges when $x = 9$. In this problem, you do not need to show your work.

a. [4 points] Which of the following could be the interval of convergence? Circle **all** that apply.

$[0, 8]$ $[0, 7]$ $(-1, 9)$ $(-2, 10)$ $(0, 8]$

b. [2 points] The limit of the sequence a_n is 0.

ALWAYS **SOMETIMES** **NEVER**

c. [2 points] The series $\sum_{n=0}^{\infty}(-5)^n a_n$ converges.

ALWAYS **SOMETIMES** **NEVER**