5. [9 points]

a. [5 points] Determine the radius of convergence of the power series

$$\sum_{n=0}^{\infty} \frac{n!(3n)}{(2n)!\,3^n}(x-7)^n.$$

Show all your work.

Radius: _____

b. [4 points] The power series $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{6^n\sqrt{n^2+n+7}}(x-4)^n$ has radius of convergence $R = 6$.

At which of the following x-values does the power series converge? Circle <u>all</u> correct answers. You do not need to justify your answer.

i. $x = -6$

ii. $x = -2$

iii. $x = 0$

iv. $x = 4$

v. $x = 6$

vi. $x = 10$

vii. $x = 12$

viii. NONE OF THESE