6. [14 points]   Consider the power series

$$\sum_{n=3}^{\infty} \frac{(3-x)^{3n}}{8^n(n-2)}.$$

(a) [5 points of 14]   Does this power series converge at $x = 1$? Explain.

(b) [5 points of 14]   Does this power series converge at $x = 5$? Explain.

(c) [4 points of 14]   Find the interval of convergence of this power series.