HW Supplement for sec 10.1 Name & Box Number:

1. Determine whether the sequence converges or diverges. If it converges, find the limit. Also, it is a geometric sequence, state so.

(a) $a_n = \frac{3^{n+1}}{5^n}$ (b) $a_n = \sqrt{\frac{9n}{n+3}}$ (c) $a_n = \frac{(-1)^n n^3}{n^3+1}$

(d) $a_n = \cos\frac{2}{n}$ (e) $\frac{(2n-1)!}{(2n+1)!}$ (f) $a_n = \frac{\sin 2n}{1+\sqrt{n}}$

(g) $a_n = \frac{(\ln n)^2}{n}$ (h) $a_n = (1+\frac{2}{n})^n$ (i) $a_n = \frac{2^{n+1}}{(n+1)!}\cdot\frac{n!}{2^n}$

(j) $\sqrt{2}, \sqrt{2\sqrt{2}}, \sqrt{2\sqrt{2\sqrt{2}}}, \ldots\ldots$

2. It can be shown that the sequence defined by $a_1 = 2, \quad a_{n+1} = \frac{1}{3-a_n}$ satisfies $0 < a_n \leq 2$ and it is decreasing. Is it convergent? If so, find the limit.