Calculus Study Guide: 10.1

Determine whether the sequence converges or diverges. If it converges, find its limit.

$a_n = \frac{e^n}{n^2} \frac{\infty}{\infty} \xrightarrow{LR} \frac{e^n}{2n} \frac{\infty}{\infty} \rightarrow \frac{e^n}{2} \rightarrow \infty$

__Converges. Limit = _____ ✓__Diverges

$a_n = sin\frac{\pi(2n-1)}{2}$ 1, −1, 1, −1

__Converges. Limit = _____ ✓__Diverges

A sequence is defined recursively as $a_1 = 9$, $a_n = (-\frac{2}{3})a_{n-1}$.

$a_2 = -6$

$a_3 = 4$

$a_4 = -8/3$

✓__Converges. Limit = 0 __Diverges

$a_n = \left(\frac{5}{4}\right)^n$

__Converges. Limit = _____ ✓__Diverges

$a_n = \left(\frac{4}{5}\right)^n \longrightarrow 0$

✓ Converges. Limit = 0 __Diverges

$a_n = 4 + (-1)^n$

3, 5, 3, 5

__Converges. Limit = _____ ✓ Diverges

Calculate the first 4 terms of the sequence, starting with n = 1.

$b_n = \left(1 + \frac{1}{n}\right)^n$ $b_1 = (2)^1$ $b_2 = \left(1 + \frac{1}{2}\right)^2$ $b_3 = \left(1 + \frac{1}{3}\right)^3$

$b_4 = \left(1 + \frac{1}{4}\right)^4$

$b_1 =$ 2 $b_2 =$ 2.25 $b_3 =$ 2.370 $b_4 =$ 2.441