Worksheet 10.1.
Sequences

1. Calculate the first four terms of the sequence $b_n = \cos \pi n$, starting with $n = 1$.

2. Calculate the first four terms of the sequence $b_n = 2 + (-1)^n$, starting with $n = 1$.

3. Use Theorem 2 to determine the limit of the sequence $b_n = \dfrac{3n + 1}{2n + 4}$ or state that the sequence diverges.

4. Use Theorem 2 to determine the limit of the sequence $c_n = 4(2^n)$ or state that the sequence diverges.

5. Determine the limit of the sequence $y_n = \dfrac{e^n}{2^n}$ or show that the sequence diverges (justifying each step using the appropriate Limit Laws or Theorems).

6. Determine the limit of the sequence $a_n = \dfrac{\sqrt{n}}{\sqrt{n+4}}$ or show that the sequence diverges (justifying each step using the appropriate Limit Laws or Theorems).

7. Determine the limit of the sequence $b_n = e^{n^2-n}$ or show that the sequence diverges (justifying each step using the appropriate Limit Laws or Theorems).

8. Determine the limit of the sequence $b_n = \dfrac{3-4^n}{2+7\cdot 4^n}$ or show that the sequence diverges (justifying each step using the appropriate Limit Laws or Theorems).

9. Show that $a_n = \dfrac{3n^2}{n^2+2}$ is strictly increasing. Find an upper bound.