Math 182 Quiz 5 **1 April 2022**

1. Find the first 5 terms of the following sequence:

$$a_n = -2n + 1$$

.

2. Find a closed form for the following sequence:

$$5, \frac{5}{4}, \frac{5}{16}, \frac{5}{64}, \frac{5}{256}, \ldots$$

3. Find a recursive form for the following sequence: - $3, 4, 7, 12, 19, \ldots$

4. For each of the following series, use the Divergence, Alternating series test or Integral test to determine if the series converges.

- $\sum_{n=1}^{\infty} \frac{4n^5+n+2}{4n^5}$.

- $\sum_{n=1}^{\infty} \frac{\left(2n^2+1\right)(-1)^n}{4n^3}$.

- $\sum_{n=1}^{\infty} \frac{1}{n}$.

1 Answers

Problem One

1. ∘ $-1, -3, -5, -7, -9$ if you start with $n = 1$, or $1, -1, -3, -5, -7$ if you start with $n = 0$.
2. ∘ Answers can vary depending on your choice of starting index. For example, $5\left(\frac{1}{4}\right)^n$ if $n = 0, 1, \ldots$.
3. ∘ Answers can vary depending on your choice of starting index. For example, if $a_0 = 3$ then $a_n = 1a_{n-1} + 2n - 1$.
4. Question 4
   - $\sum_{n=1}^{\infty} \frac{4n^5+n+2}{4n^5}$ diverges by the Divergence test.
   - $\sum_{n=1}^{\infty} \frac{\left(2n^2+1\right)(-1)^n}{4n^3}$ converges by the Alternating series test.
   - $\sum_{n=1}^{\infty} \frac{1}{n}$ diverges by the Integral test.