MATH 242 - Quiz 6 REMIX

04/04/2024

1. **[3 pts]** List the first three terms a_1, a_2, a_3 of the following sequence

$$\left\{(-1)^n \frac{2}{2n^2-1}\right\}_{n=1}^{\infty}$$

$a_1 = -2$

$a_2 = \frac{2}{7}$

$a_3 = -\frac{2}{17}$

2. **[3 pts]** Find a formula for the general nth term of the sequence:

$$\left\{\frac{1}{4}, -\frac{3}{8}, \frac{5}{12}, -\frac{7}{16}, \frac{9}{20}, \dots\right\}$$

$$\frac{(-1)^{n+1}(2n-1)}{4n}$$

3. [**4 pts**] Prove the sequence is monotone. (Hint: consider $f(x) = \frac{x}{1-2x}$):

$$a_n = \frac{n}{1-2n}$$

$$f(x) = \frac{x}{1-2x}$$

$$f'(x) = \frac{(1-2x)+2x}{(1-2x)^2}$$

$$= \frac{1}{(1-2x)^2} \quad \frac{(+)}{(+)} > 0$$

increasing