

- ① Name Gregg Mr } Waterman
- ② Major - Dr }
- ③ Hometown Casper, WY Prof }
- ④ a) Do you have class at 9:00^{AM} on Tuesdays?
- b) " " " " 11:00^{AM} " " ?
- ⑤ Do you usually have a device in class on which you can access the internet?
- ⑥ Do you own the current OIT calc text?
- ⑦ Why are you taking this class?
- ⑧ Tell me something else about you.

Sequences

$$1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$$

term

$$a_0, a_1, a_2, \dots$$

$$\{a_n\}_{n=0}^{\infty}$$

Series

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$$

$$a_0 + a_1 + a_2 + a_3 + \dots$$

$$\sum_{n=0}^{\infty} a_n$$

Sequence $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$
Two ways to define:

Recursively: $a_{n+1} = \frac{1}{2} a_n ; a_0 = 1$

$$a_{n+1} = 3a_n - 2 ; a_1 = 1$$

First five terms: $1, 1, 1, 1, 1, \dots$

Explicitly: $a_n = \left(\frac{1}{2}\right)^n ; n = 0, 1, 2, 3, \dots$

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots = \sum_{n=0}^{\infty} \left(\frac{1}{2}\right)^n$$

Convergence + divergence of Sequences.

$1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$ converges to zero.

$$\lim_{n \rightarrow \infty} \left(\frac{1}{2}\right)^n = 0$$

$1, 1, 1, 1, \dots$ converges to one

1, -1, 1, -1, 1, -1, ...

Recursive and explicit descriptions?

$$a_{n+1} = -a_n; a_1 = 1$$

$$a_n = (-1)^{n+1}; n = 1, 2, 3, \dots$$

Does the sequence converge, or does it diverge?

The sequence diverges.

$$\text{OR } a_n = (-1)^n; n = 0, 1, 2, \dots$$

2, 4, 6, 8, ... diverges

$$\sum_{n=0}^{\infty} \left(\frac{1}{2}\right)^n = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots \quad \underline{\underline{\text{Series}}}$$

Sequence of partial sums:

$$S_0 = 1$$

$$S_3 = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = \frac{15}{8}$$

$$S_1 = 1 + \frac{1}{2} = \frac{3}{2}$$

$$S_2 = 1 + \frac{1}{2} + \frac{1}{4} = \frac{7}{4}$$

