SEQUENCES

BLAKE FARMAN

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Name: _____

List the first five terms of the sequence.

1. $a_n = \dfrac{2^n}{2n+1}$

2. $a_n = \dfrac{n^2-1}{n^2+1}$

3. $a_n = \dfrac{1}{(n+1)!}$

4. $a_1 = 1$, $a_{n+1} = 5a_n - 3$

Find a formula for the general term of the sequence $\{a_n\}_{n=1}^{\infty}$, assuming that the pattern continues.

5. $\left\{\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \dots\right\}$

6. $\left\{4, -1, \frac{1}{4}, -\frac{1}{16}, \frac{1}{64}, \dots\right\}$

7. $\left\{-3, 2, -\frac{4}{3}, \frac{8}{9}, -\frac{16}{27}, \dots\right\}$

8. $\{5, 8, 11, 14, 17, \dots\}$

9. $\left\{\frac{1}{2}, -\frac{4}{3}, \frac{9}{4}, -\frac{16}{5}, \frac{25}{6}, \dots\right\}$

10. $\{1, 0, -1, 0, 1, 0, -1, 0, \dots\}$

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

11. $a_n = \dfrac{3 + 5n^2}{n + n^2}$

12. $a_n = \dfrac{n^4}{n^3 - 2n}$

13. $a_n = 3^n 7^{-n}$

14. $a_n = \sqrt{\dfrac{1+4n^2}{1+n^2}}$

15. $a_n = \dfrac{3\sqrt{n}}{\sqrt{n}+2}$

16. $a_n = \cos\left(\dfrac{n\pi}{n+1}\right)$