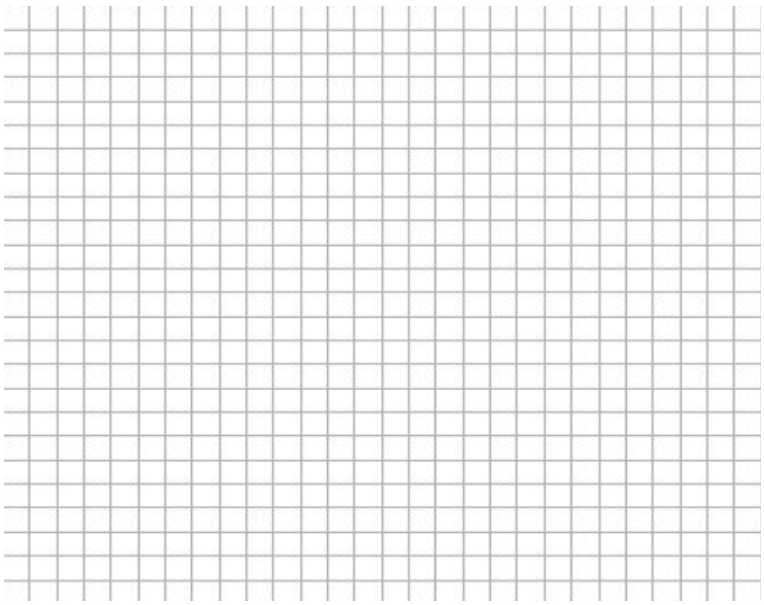
1. Write the first 5 terms of the sequence.

   a. $a_n = \dfrac{3^n}{n!}$

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

2. Graph the first 10 terms of the sequence $a_n = 2 - \dfrac{4}{n}$ by hand and then check your result using a graphing calculator.



3. Simplify the ratio of factorials.

a. $\dfrac{25!}{22!}$

b. $\dfrac{(n+1)!}{n!}$

4. Determine the convergence or divergence of the sequence with the given *n*th term. If the sequence converges, find its limit.

a. $a_n = 1+(-1)^n$

b. $a_n = \dfrac{\sqrt[3]{n}}{\sqrt[3]{n}+1}$

c. $a_n = \dfrac{(n-2)!}{n!}$

d. $a_n = \dfrac{\cos \pi n}{n^2}$

e. $a_n = \dfrac{\ln \sqrt{n}}{n}$

5. Determine whether the sequence with the given nth term is monotonic. Discuss the boundedness of the sequence.

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

b. $a_n = \left(-\frac{2}{3}\right)^n$

c. $a_n = ne^{-n/2}$

6. Use the Bounded Monotonic Sequences theorem to show that the sequence with the given nth term converges and use a graphing calculator to graph the first 10 terms of the sequence and find its limit.

$$a_n = 4 + \frac{1}{2^n}$$