Worksheet 7

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

1. $a_n = \dfrac{n^3}{n+1}$.

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

3. $a_n = \dfrac{(-1)^n n^3}{n^3 + 2n^2 + 1}$.

4. $a_n = n\cos(n\pi)$.

5. $a_n = \ln(n+1) - \ln(n)$.

6. $a_n = \dfrac{\sin(2n)}{1 + \sqrt{n}}$.

7. $a_n = \dfrac{\ln^2(n)}{n}$.

8. $a_n = \dfrac{(-3)^n}{n!}$.