Sequences that converge to 0

Solution: cards labled with multiples of two.

(2) $\dfrac{5}{2n+1} \to 0$

(4) $\dfrac{e^n}{n!} \to 0$

(8) $\sin\left(\dfrac{1}{n}\right) \to 0$

(16) $\dfrac{(-1)^n n}{e^n} \to 0$

(22) $\dfrac{\sin n^2}{\sqrt{n}} \to 0$

(26) $\dfrac{(-1)^n n^4}{n!} \to 0$

(34) $\dfrac{n8^n}{3^{2n+1}} \to 0.$

Sequences that converge, but not to 0

Solution: cards labled with multiples of three.

(3) $\cos\left(\dfrac{n}{n^2}\right) \to 1$

(9) $\left(1+\dfrac{1}{n}\right)^n \to e$

(27) $\dfrac{\ln n}{\ln(n^2)} \to \dfrac{1}{2}$

(33) $\dfrac{\sqrt{n^2+1}}{3n-1} \to \dfrac{1}{3}.$

Sequences that diverge to ∞

Solution: cards labled with multiples of five.

(5) $\dfrac{n}{\ln n} \to \infty$

(25) $\dfrac{10^n}{n5^n} \to \infty$

(55) $\dfrac{n^2}{n \ln n} \to \infty$

(85) $\dfrac{e^n}{\sqrt{n}} \to \infty.$

Sequences that diverge, but not to ∞

Solution: cards labled with multiples of seven.

(7) $\dfrac{3n^3+n}{1-4n^2} \to -\infty$

(49) $\dfrac{(-1)^n 2^n}{n^4}$ diverges, but not to $\pm\infty$

(77) $\dfrac{(-1)^n n^2}{n^2+1}$ diverges, but not to $\pm\infty$.