Do the following sequences converge or diverge?
If the sequence converges, find the limit.

1. $\left\{ \dfrac{5k^2 - 42}{3k^2 + 5} \right\}_{k=1}^{\infty}$

2. $\left\{ \dfrac{e^j}{j^2 + 32j} \right\}_{j=3}^{\infty}$

3. $\left\{ \dfrac{\sin(k)}{k^2} \right\}_{k=1}^{\infty}$

4. $\left\{ (-1)^k \right\}_{k=1}^{\infty}$