11. \( \sum_{k=1}^{\infty} ke^{-3k^2} \) 
\( f(x) = xe^{-3x^2} \) is continuous, positive, nonincreasing on \([1, \infty]\)
\[
\int_{1}^{\infty} xe^{-3x^2} \, dx = \left[-\frac{1}{6} e^{-3x^2}\right]_{1}^{\infty} = \frac{1}{6e^3}
\]
Convergent.

15. \( \sum_{k=1}^{\infty} \left[ \left(\frac{1}{2}\right)^k + \frac{k-1}{2k+1} \right] \)
\( \sum_{k=1}^{\infty} \left(\frac{1}{2}\right)^k \) is geometric series \( r = 1/2 < 1 \) then it is convergent.
\( \sum_{k=1}^{\infty} \frac{k-1}{2k+1} \) is divergent by nth term test. Since the sum of convergent series and divergent series is divergent then the whole series is divergent.

25. \( \sum_{k=1}^{\infty} \frac{1}{1+k^2} \) is continuous, positive, nonincreasing on \([5, \infty]\)
\[
E = \sum_{k=6}^{\infty} \frac{1}{1+k^2} \leq \int_{5}^{\infty} \frac{1}{1+x^2} \, dx = [\arctan(x)]_{5}^{\infty} = \frac{\pi}{2} - \arctan 5 \approx 0.1924
\]