Approximating with Taylor polynomials

1. Find an upper bound on the error in using a 6th degree Taylor polynomial based at 0 to approximate \( \cos(0.21) \).

2. Find an upper bound on the error in using a 6th degree Taylor polynomial based at 0 to approximate \( e^{0.43} \). Hint: For all \( t \) between 0 and 1, we have \( e^t < e^1 < 3 \).

3. Use a Taylor polynomial to approximate \( \sin(0.032) \) within a tolerance of \( \pm 10^{-8} \).

4. Use a Taylor polynomial to approximate \( e^{0.09} \) to within a tolerance of \( \pm 10^{-8} \).