1. Let $f(x) = \cos(x^2) - x\sin(x)$
   a. Find $f'(x)$ by hand.
   b. Verify your answer by using Maple to graph $y = f(x)$ and $y = f'(x)$ on the same set of axes on the interval $[-3, 3]$.
   c. Also verify your answer by using Maple to differentiate $f(x)$.

2. Find the maximum and minimum values of

$$g(x) = \ln(x) - \frac{x^2}{20}$$

   on the interval $[1, 12]$.

3. Find the maximum and minimum values of $f(x)$ from #1 on the interval $[0, 3]$.