Let

$$f(x) = \cos(x) - \sin(x)$$

$$g(x) = 4e^x - 3\cos(x) - \frac{1}{x}$$

$$h(x) = 3\sin(4) + 2\sin(x) - \ln(x) + x^{732}$$

1. Find the derivatives of each function.

2. Now find the antiderivative of each function. Check your answer by taking the derivative!

3. Find the maximum and minimum values of $f(x)$ on the interval $[-\pi, \pi]$.