Find the derivatives of the following functions.

1. $f(x) = 2x - 7\ln(x) + e^{2x}$,

2. $f(x) = 5\ln\left(\dfrac{1}{x}\right) - e^{-2x} + 2$,

3. $f(x) = \dfrac{3}{e^{5x}} + 4\ln\left(\dfrac{1}{\sqrt{x}}\right) - \dfrac{1}{x}$.

For each of the functions below, find the derivative. Give the domain of each of the functions. Find the x and y-intercepts and any asymptotes if they exist. Also, list all critical points for each graph and determine if they are maxima or minima. Sketch the curves of the functions.

4. $y = 100(e^{-0.05x} - e^{-0.2x})$,

5. $y = x^2 - 2\ln(x)$.