1. Determine whether the given set of functions is linearly independent or dependent on the interval $(-\infty, \infty)$.

   (a) $f_1(x) = \sin(x)$, $f_2(x) = \cos(x)$.

   (b) $f_1(x) = e^{-x}$, $f_2(x) = e^x$.

   (c) $f_1(x) = x$, $f_2(x) = x^3$. For this problem assume the interval is $(0, \infty)$.

   (d) $f_1(x) = -x^2$, $f_2(x) = 10x^2$. For this problem assume the interval is $(0, \infty)$.