Directions: Show all work and simplify your answers.

1. For each function $f(x)$, find $f^{-1}(x)$ or show that it is not one-to-one function.

   a) $f(x) = \frac{4x+3}{2x+1}$

   b) $f(x) = \frac{(x^2-5)^2}{5}$

   c) $f(x) = \frac{4-\sqrt[3]{4x}}{2}$

2. Find $(f^{-1})'(a)$.

   a) $f(x) = -4x^3 - 4$, $a = 0 = f(-1)$

   b) $f(x) = \sqrt{2x-3}$, $a = 1 = f(2)$

c) $f(x) = 5 + \frac{1}{2}x^2 + \sin(\pi x)$, $a = 5 = f(0)$

3. Find the derivative of this equation, $f(x) = 3^x e^{\sin(x)}$

4. For $f(x) = 2e^x + e^{2x}$, find:

   a Domain and Range

   b $f'(x)$

   c $\lim_{x\to+\infty} f(x)$

   d $\lim_{x\to-\infty} f(x)$