Derivatives of Inverse Functions Homework

1) For $f(x) = x^2, x \geq 0$, calculate the value of $(f^{-1})'(x)$ when $x = 4$.

2) For $f(x) = \frac{1}{4}x^3 + x - 1$, calculate the value of $(f^{-1})'(x)$ when $x = 3$.

3) Find the derivative of the inverse function of $f(x) = e^x + \ln x$ at $x = e$.

4) Find the derivative of the inverse function of $y = e^{x^2}, x > 0$.

5) Determine the equation of the tangent line to $f^{-1}(x)$ at the point where x = 3, given the following information: $f(2) = 3$ and $f'(2) = 5$.

6) Determine the equation of the tangent line to $f^{-1}(x)$ at the point (-5, 0), given the function $f(x) = -5 + 2x - \cos x$. (hint: use alternate form of the derivative)

7) Find $g'(2)$, where g is the inverse function of $f(x) = x^5 - x^3 + 2x$.

8) Calculate $g'(1)$, where $g(x)$ is the inverse of the function $f(x) = x + e^x$.