Directions: Closed book, closed notes, no calculators.

1. Find the following derivatives.

   (a) $\dfrac{d}{dx}\left[\ \ln(x) + \tan^{-1}(x)\ \right] =$

   (b) $\dfrac{d}{dx}\left[\ \ln\left(x^4 - 10x^2 - 1\right)\ \right] =$

   (c) $\dfrac{d}{dx}\left[\dfrac{\ln(x)}{x}\right] =$

2. An object moving on a line is $s(t) = t^3 + 5t^2 + 1$ meters from a fixed point on the line at time t. What is the object's velocity when its acceleration is 22 meters per second per second?