Worksheet 9/27/2024

1) Find $f'(a)$ where $f(x) = \frac{1}{x}$

2) Find the equation of the tangent line to the hyperbola $y = \frac{1}{x}$ at $x = 1$.

3) Find the equation of the tangent line to the hyperbola $y = \frac{1}{x}$ at $x = 2$.

4) The position function of a falling object is $s(t) = \frac{1}{2}gt^2 + v_0t + s_0$, where $g \approx 9.8\, m/s^2$ is the gravitational acceleration, v_0 is the initial velocity, and s_0 is the initial position. Suppose that the initial position is $s_0 = 450$ and initial velocity $v_0 = 0$. What is the velocity after 5 s? How about the velocity right before touching the ground?