Quiz 12

1. (5 points). Find all of the antiderivative of $f(x) = x(2x + 1)$.

2. (5 points). Find $f(x)$ if $f''(x) = 2 - \frac{1}{x^2}$, $f'(1) = 5$, and $f(1) = 4$ (domain $x > 0$).

3. (5 points). A particle is moving along a line with velocity $v(t) = \sin t - \cos t$. If $s(0) = 0$, find the position $s(t)$ of the particle.

Extra credit. (2 points). Find all antiderivatives of $\frac{1}{x}$ with the domain $\{x \in \mathbb{R} : x \neq 0\}$.