Review of Substitution (HW #1)

The substitution technique of integration reverses the chain rule of differentiation.

Use substitution to find the following integrals. If you can guess and check the reverse of the chain rule, then do so. I will show both fast work and slow work.

$I = \int x \cos(x^2)\, dx$

$$I = \int_1^{e^\pi} \frac{\sin(\ln(x))}{x}\, dx$$

$I = \int_2^5 \frac{x}{\sqrt{x-1}}\, dx$. This one is not easily done fast.

$I = \int_{-8}^{8} 10 \sin(33x) \cos^9(88x)\, dx$. Don't work too hard, but defend your answer.