1. $\int \frac{x}{4x^2+9}\,dx$ (5 points)

Let $u = 4x^2+9$

$du = 8x\,dx$

$x\,dx = \frac{du}{8}$

So $\int \frac{x\,dx}{4x^2+9} = \int \frac{1}{8}\frac{du}{u}$

$= \frac{1}{8}\int \frac{du}{u}$

$= \frac{1}{8}\ln|u| + C$

$= \boxed{\frac{1}{8}\ln(4x^2+9) + C}$