

Name: _____

(100 points total)

1. (85 points) Evaluate the following integrals.

(a)
$$\int \frac{dx}{\sqrt{9+x^2}}$$

(b)
$$\int \frac{e^x dx}{e^{2x} + 3e^x + 2}$$

$$(c) \int \cos^5 x \, dx$$

$$(d) \int \frac{\ln x}{x^2} \, dx$$

$$(e) \int \frac{10x^2}{(x-1)(x^2+9)} dx$$

2. (15 points) Determine whether $\int_{-2}^1 \frac{1}{x^2} dx$ converges or diverges. Justify your answer.