

NAME: _____

1. Consider the following integral $\int \sec^4(x) \tan(x) dx$.

(a) List 4 different valid u-substitutions and their corresponding differentials.

(b) Solve the integral using one of the above substitutions.

2. Solve $\int \frac{dx}{\sqrt{x^2 + a^2}}$?

3. Use trig substitution to solve $\int \frac{dx}{\sqrt{x^2 + 2x + 5}}$

4. Using trigonometric substitution, prove that the following inverse trig equations are true.

$$(a) \int \frac{dx}{\sqrt{1-x^2}} = \sin^{-1}(x) + C$$

$$(b) \int \frac{-dx}{\sqrt{1-x^2}} = \cos^{-1}(x) + C$$

$$(c) \int \frac{1}{x^2+1} dx = \tan^{-1}(x) + C$$

$$(d) \int \frac{-1}{x^2+1} dx = \cot^{-1}(x) + C$$

$$(e) \int \frac{dx}{x\sqrt{x^2-1}} = \sec^{-1}|x| + C$$