

## Worksheet 4

Name:

Math 252.01(02), Calculus II, Fall 2015

*Write clear and complete solutions, you will receive no credit for unsupported solutions*

Table 1: Table of trigonometric substitutions

Expression	Substitution	Identity
$\sqrt{a^2 - x^2}$	$x = a \sin \theta, -\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$	$1 - \sin^2 \theta = \cos^2 \theta$
$\sqrt{a^2 + x^2}$	$x = a \tan \theta, -\frac{\pi}{2} < \theta < \frac{\pi}{2}$	$1 + \tan^2 \theta = \sec^2 \theta$
$\sqrt{x^2 - a^2}$	$x = a \sec \theta, 0 \leq \theta < \frac{\pi}{2}, \pi \leq \theta < \frac{3\pi}{2}$	$\sec^2 \theta - 1 = \tan^2 \theta$

Evaluate the following Integrals

1.  $\int \frac{dx}{\sqrt{x^2 - 6x + 13}}$   
HINT:  $x^2 - 6x + 13 = (x - 3)^2 + 4$

$$2. \int \frac{x^2}{\sqrt{9 - 25x^2}} dx$$

$$3. \int \frac{\sqrt{x^2 - 9}}{x^3} dx$$