Unit #2: Methods of Integration
Topic: U-Substitution with Trigonometric Identities
Objective: SWBAT find an indefinite integral of a trigonometric function by using a trigonometric identity and a u-substitution.

Warm Up #3:

Fill in the blanks for each of the trig identities shown below:

1) $\square = \frac{sin\theta}{cos\theta}$	2) $1 + \square = csc^2\theta$
3) $sec\theta = \frac{1}{\square}$	4) $sin^2\theta + cos^2\theta = \square$
5) $\square = \frac{cos\theta}{sin\theta}$	6) $1 + tan^2\theta = \square$
7) $csc\theta = \frac{1}{\square}$	8) $\square = \frac{1}{tan\theta}$

Some integrals involving trigonometric functions can only be evaluated by using their trigonometric identities.

These allow the integrand to be written in an alternative form which may be integrated more easily.

Example #1: Evaluate $\int tan5xdx$

Example #2: Evaluate $\int cos^3 x\, dx$

Problem Set #3: Evaluate each of the following.

1) $\int \frac{dx}{cos^2 2x}$	2) $\int cot 7x\, dx$

3) $\int(sin^2 3x + cos^2 3x)dx$	4) $\int sec^4 x dx$
5) $\int \frac{dx}{sin^2 3x}$	6) $\int sin^3 2x\, dx$
7) $\int cot^2 3x\, dx$	8) $\int(2 - tan^2 x)dx$

9) $\int \frac{4x^3}{csc(x^4-1)}dx$	10) $\frac{cosx}{1-cos^2x}dx$
11) $\int \frac{8}{secx}dx$	12) $\int 2sin^3x\,dx$

Answer Key:

1) $\frac{1}{2}tan2x + C$	2) $\frac{1}{7}ln\lvert sin7x\rvert + C$	3) $x + C$
4) $tanx + \frac{1}{3}tan^3x + C$	5) $-\frac{1}{3}cot3x + C$	6) $-\frac{1}{2}cos2x + \frac{1}{6}cos^3 2x + C$
7) $-\frac{1}{3}cot3x - x + C$	8) $x - tanx + C$	9) $-cos(x^4 - 1) + C$
10) $-\frac{1}{sinx} + C$	11) $8sinx + C$	12) $-2cosx + \frac{2}{3}cos^3x + C$