## Trigonometric Integration

While working in a group make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

1. Find:

$$
\int \cos ^{3}(x) \sin ^{4}(x) d x
$$

2. Recall the Pythagorean Theorem (the trigonometric version of $a^{2}+b^{2}=c^{2}$ )

$$
\sin ^{2}(x)+\cos ^{2}(x)=1
$$

(a) Use the above theorem to write down a relationship between $\tan (x) \& \sec (x)$.
(b) Use the above theorem to write down a relationship between $\cot (x)$ and $\csc (x)$.
3. Consider the strategy we developed to integrate expressions with sines and cosines. Try and develop a parallel strategy when working the following examples:

$$
\int \tan ^{6}(y) \sec ^{4}(y) d y \quad \int \tan ^{4}(x) d x
$$

$$
\int \tan (\theta) \sec ^{4}(\theta) d \theta
$$

4. Record your strategy by finishing the following sentences: Given $\int \tan ^{m}(x) \sec ^{n}(x) d x$,
(a) if $n$ is even...
(b) if $m$ is odd...
