## Trig Identities:
- \( \sin^2 \theta + \cos^2 \theta = 1 \)
- \( 1 + \tan^2 \theta = \sec^2 \theta \)
- \( 1 + \cot^2 \theta = \csc^2 \theta \)
- \( \sin(A \pm B) = \sin A \cos B \pm \sin B \cos A \)
- \( \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B \)
- \( \tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B} \)
- \( \sin^2 x = \frac{1}{2} (1 - \cos 2x) \)
- \( \cos^2 x = \frac{1}{2} (1 + \cos 2x) \)
- \( \sin(2\theta) = 2 \sin \theta \cos \theta \)
- \( \cos(2\theta) = \cos^2 \theta - \sin^2 \theta \)

## Trig Integral Strategies
- \( \int \sin^m x \cos^n x \, dx \)
- \( \int \tan^m x \sec^n x \, dx \)
- \( \int \tan x \, dx \)
- \( \int \sin(mx) \cos(nx) \, dx \)
- \( \int \sec x \, dx \)
- \( \int \sec^3 x \, dx \)
- Others

## Warm-up Problems

1. **Clicker** \( \int \sin x \cos x \, dx = ?? \)
   - (a) \( \frac{1}{2} \sin^2 x + C \)
   - (b) \(-\frac{1}{2} \cos^2 x + C \)
   - (c) Both A and B
   - (d) Neither A nor B
   - (e) Anything you want it to be

2. Find the derivatives:
   - (a) \( \frac{d}{dx} (\sec x + \tan x) \)
   - (b) \( \frac{d}{dx} (\csc x + \cot x) \)

3. Use integration by parts.
   \( \int \sec^3 x \, dx \)

## Class Problems

4. Compute \( \int \sec x \, dx \)

5. Compute \( \int \csc x \, dx \)
6. **Clicker** Identify the strategy to integrate
\[ \int \sin^4 x \cos^5 x \, dx \]
(a) Use \( \cos^2 x = 1 - \sin^2 x \) and then let \( u = \sin x \).
(b) Use \( \sin^2 x = 1 - \cos^2 x \) and then let \( u = \cos x \).
(c) Use half angle identities to reduce the even powers of \( \sin x \) and \( \cos x \).
(d) Give up, nothing will work

7. **Clicker** Identify the strategy to integrate
\[ \int \sin^5 x \cos^4 x \, dx \]
(a) Use \( \cos^2 x = 1 - \sin^2 x \) and then let \( u = \sin x \).
(b) Use \( \sin^2 x = 1 - \cos^2 x \) and then let \( u = \cos x \).
(c) Use half angle identities to reduce the even powers of \( \sin x \) and \( \cos x \).
(d) Give up, nothing will work

8. **Clicker** Identify the strategy to integrate
\[ \int \sin^4 x \cos^6 x \, dx \]
(a) Use \( \cos^2 x = 1 - \sin^2 x \) and then let \( u = \sin x \).
(b) Use \( \sin^2 x = 1 - \cos^2 x \) and then let \( u = \cos x \).
(c) Use half angle identities to reduce the even powers of \( \sin x \) and \( \cos x \).
(d) Give up, nothing will work

9. Actually compute the integrals above.