**Calc BC Int Trig Powers WS** Name: Block: Seat:

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

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

1. If the power of sine is odd and positive, save one sine and convert the rest to cosines.
2. If the power of cosine is odd and positive, save one cosine and convert the rest to sines.
3. If the powers of both the sine and cosine are even and nonnegative, use the half-angle identities to convert the integrand to odd powers of the cosine.

1.

$$\int \sin^3 x \; dx$$

2.

$$\int \cos^3 x \; dx$$

3.

$$\int \sin^3 x \cos^4 x \; dx$$

4.

$$\int \frac{\cos^3 x}{\sqrt{\sin x}} \; dx$$

5.

$$\int \cos^4 x \; dx$$

$$\tan^2 x = \sec^2 x - 1$$
$$\sec^2 x = \tan^2 x + 1$$

Guidelines for Evaluating Integrals Involving Secant and Tangent

1. If the power of secant is even and positive, save a $\sec^2$ factor and convert the rest to tangents.
2. If the power of the tangent is odd and positive, save a secant-tangent and convert the rest to secants.
3. If there are no secants and the power of tangent is even and positive, convert a tangent-squared to a $(\sec^2 x - 1)$. Expand and repeat as necessary.
4. If the integral is only secant with an odd positive power, use integration by parts.
5. If none of the first four guidelines apply, try to convert to sines and cosines.

6.
$$\int \frac{\tan^3 x}{\sqrt{\sec x}}\, dx$$

7.
$$\int \sec^4(3x)\tan^3(3x)\, dx$$