

Name: _____

Notesheet. Section 12.4: Integration of Trigonometric Functions

Math 1220

Theorem 1. We have the following integrals.

(a) $\int \sin(x) dx =$

(b) $\int \cos(x) dx =$

Challenge 2. Evaluate $\int \cos(2x) dx$.

Challenge 3. Evaluate $\int \cos^2(x) dx$.

Challenge 4. Evaluate $\int \frac{\sin(x)}{1 + \cos(x)} dx$

Theorem 5. Using a similar u -substitution to the above,

$$\int \tan(x) dx = \int \frac{\sin(x)}{\cos(x)} dx = -\ln |\cos(x)| + C$$

Theorem 6 (Some Trigonometric Integrals). We have the following integrals.

• $\int \cos(x) dx =$

• $\int \sin(x) dx =$

• $\int \sec(x) \tan(x) dx =$

• $\int \csc(x) \cot(x) dx =$

• $\int \sec^2(x) dx =$

• $\int \csc^2(x) dx =$

Challenge 7. Evaluate the following definite integrals

(a) $\int_0^{\frac{\pi}{2}} \sin(x) dx$

(b) $\int_0^{\frac{\pi}{2}} \cos(\theta) d\theta$

(c) $\int_0^{\pi} \sec^2\left(\frac{t}{4}\right) dt$