

More Integrals of Trig

p. 386 - 392 (5.5)

# 71

$$\int (\tan(u)) du = -\ln(|\cos(u)|) + C$$

$$\int (\cot(u)) du = \ln(|\sin(u)|) + C$$

$$\int (\sec(u)) du = \ln(|\sec(u) + \tan(u)|) + C$$

$$\int (\csc(u)) du = -\ln(|\csc(u) + \cot(u)|) + C$$

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Integrate the following:

1.  $\int \left( \frac{\sec \sqrt{x}}{5\sqrt{x}} \right) dx$

$u = \sqrt{x}$   
 $du = \frac{1}{2} x^{-1/2} dx$   
 $dx = 2\sqrt{x} du$

$$= \int \frac{\sec u}{5\sqrt{x}} 2\sqrt{x} du$$

$$= \frac{2}{5} \int \sec u$$

$$= \frac{2}{5} \ln |\sec \sqrt{x} + \tan \sqrt{x}| + C$$

\*\*2.  $\int (\tan(2t)) dt$

$u = 2t$   
 $du = 2dt$   
 $dt = \frac{1}{2} du$

$$= \frac{1}{2} \int \tan u du = \frac{1}{2} \int \frac{\sin u}{\cos u} du$$

$v = \cos u$   
 $dv = -\sin u du$   
 $du = \frac{dv}{-\sin u}$

$$= \frac{1}{2} \int \frac{\sin u}{v} \frac{dv}{-\sin u} = -\frac{1}{2} \int \frac{dv}{v}$$

$$= -\frac{1}{2} \ln |\cos 2t| + C$$