

**Math 122 - #4**  
**Trigonometric Substitution**

1.  $\int \frac{dx}{x^2\sqrt{9-x^2}}$

2.  $\int \frac{dx}{\sqrt{x^2+4}}$

3.  $\int \frac{dx}{(x^2+1)^{3/2}}$

4.  $\int \frac{\sqrt{x^2-3}}{x} dx$

5.  $\int \sqrt{1-x^2} dx$

Answers

1.  $-\frac{1}{9} \left( \frac{\sqrt{9-x^2}}{x} \right) + C$

2.  $\ln \left| \frac{\sqrt{x^2+4}}{2} + \frac{x}{2} \right| + C$

3.  $\frac{x}{\sqrt{x^2+1}} + C$

4.  $\sqrt{x^2-3} - \sqrt{3} \operatorname{arcsec} \left( \frac{x}{\sqrt{3}} \right) + C$

5.  $\frac{1}{2} \arcsin x + \frac{1}{2} x \sqrt{1-x^2} + C$