REFERENCE SHEET
MATH 1502

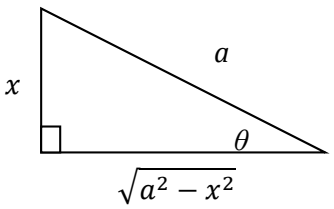
INTEGRATION FORMULAS

1. $\int u^n du = \frac{u^{n+1}}{n+1} + C, n \neq 1$
2. $\int u^{-1} du = \int \frac{1}{u} du = \ln|u| + C$
3. $\int e^u du = e^u + C$
4. $\int \sin u \, du = -\cos u + C$
5. $\int \cos u \, du = \sin u + C$
6. $\int \sec^2 u \, du = \tan u + C$
7. $\int \csc^2 u \, du = -\cot u + C$
8. $\int \sec u \tan u \, du = \sec u + C$
9. $\int \csc u \cot u \, du = -\csc u + C$
10. $\int \tan u \, du = \ln|\sec u| + C$
11. $\int \cot u \, du = \ln|\sin u| + C = -\ln|\csc u| + C$
12. $\int \sec u \, du = \ln|\sec u + \tan u| + C$
13. $\int \csc u \, du = \ln|\csc u - \cot u| + C$
14. $\int \frac{du}{\sqrt{a^2-u^2}} = \sin^{-1}\left(\frac{u}{a}\right) + C$
15. $\int \frac{du}{a^2+u^2} = \frac{1}{a}\tan^{-1}\left(\frac{u}{a}\right) + C$
16. $\int \frac{du}{u\sqrt{u^2-a^2}} = \frac{1}{a}\sec^{-1}\left(\frac{u}{a}\right) + C$

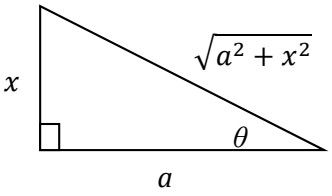
IDENTITIES

1. $\sin^2 u + \cos^2 u = 1$
2. $1 + \tan^2 u = \sec^2 u$
3. $1 + \cot^2 u = \csc^2 u$
4. $\sin 2u = 2 \sin u \cos u$
5. $\cos 2u = \begin{cases} \cos^2 u - \sin^2 u \\ 2\cos^2 u - 1 \\ 1 - 2\sin^2 u \end{cases}$

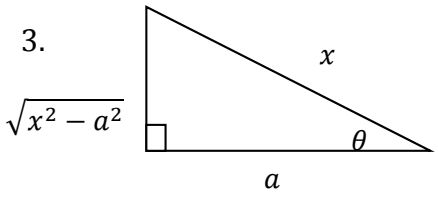
USEFUL TRIANGLE TRIG.

1. 

$\sin\theta = \frac{x}{a}$

2. 

$\tan\theta = \frac{x}{a}$

3. 

$\sec\theta = \frac{x}{a}$