MATH122
Trig Identities and Formulas for Tests

To be memorized:

$\csc u = \dfrac{1}{\sin u}$ $\quad \sec u = \dfrac{1}{\cos u}$ $\quad \cot u = \dfrac{1}{\tan u}$ $\quad \tan u = \dfrac{\sin u}{\cos u}$ $\quad \cot u = \dfrac{\cos u}{\sin u}$

$\sin^2 u + \cos^2 u = 1$ $\quad \sin 2u = 2\sin u\ \cos u$ $\quad \cos 2u = \cos^2 u - \sin^2 u$

To be memorized or quickly derived:

$\tan^2 u + 1 = \sec^2 u$ $\quad \cot^2 u + 1 = \csc^2 u$ $\quad \cos 2u = 2\cos^2 u - 1$ $\quad \cos 2u = 1 - 2\sin^2 u$

$\sin^2 u = \dfrac{1-\cos 2u}{2}$ $\quad \cos^2 u = \dfrac{1+\cos 2u}{2}$

Identities and formulas for tests: (to be given by the instructor)

$\sin(u \pm v) = \sin u \cos v \pm \cos u \sin v$

$\cos(u \pm v) = \cos u \cos v \mp \sin u \sin v$

$\sin \dfrac{u}{2} = \pm\sqrt{\dfrac{1-\cos u}{2}}$

$\cos \dfrac{u}{2} = \pm\sqrt{\dfrac{1+\cos u}{2}}$

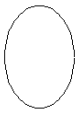
$\dfrac{\sin A}{a} = \dfrac{\sin B}{b} = \dfrac{\sin C}{c}$

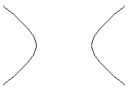
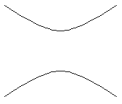
$c^2 = a^2 + b^2 - 2ab\cos C$

$a_n = a_1 + (n-1)d$; $\quad S_n = \dfrac{n}{2}(a_1 + a_n)$

$a_n = a_1 r^{n-1}$; $\quad S_n = a_1 \dfrac{(1-r^n)}{1-r}$; $\quad S = \dfrac{a_1}{1-r}$

Circle: $(x-h)^2 + (y-k)^2 = r^2$  $ax^2 + ay^2 + bx + cy + d = 0$ 

Ellipse: $\dfrac{(x-h)^2}{a^2} + \dfrac{(y-k)^2}{b^2} = 1$  $\dfrac{(x-h)^2}{b^2} + \dfrac{(y-k)^2}{a^2} = 1$ 

Hyperbola: $\dfrac{(x-h)^2}{a^2} - \dfrac{(y-k)^2}{b^2} = 1$  $-\dfrac{(x-h)^2}{b^2} + \dfrac{(y-k)^2}{a^2} = 1$ 

Parabola: $(x-h)^2 = 4p(y-k)$  $(y-k)^2 = 4p(x-h)$