Vocabulary

ACCELERATION	EVEN	PARABOLA	SYMMETRY
COMPRESS	HORIZONTAL	PERIODIC	TANGENT
CONCAVE	INFLECTION	PERPENDICULAR	VELOCITY
CONSTANT	INTEGRATE	POLYNOMIAL	VERTICAL
COSINE	INTEGRATION	QUADRATIC	REFLECTION
DERIVATIVE	LINEAR	SECANT	
DIFFERENTIATE	ODD	SINE	
EXPONENT	OPTIMUM	STRETCH	

Trigonometry Review

Unit Circle	
$\sin t = y$	$\csc t = \dfrac{1}{y}$
$\cos t = x$	$\sec t = \dfrac{1}{x}$
$\tan t = \dfrac{y}{x}$	$\cot t = \dfrac{x}{y}$
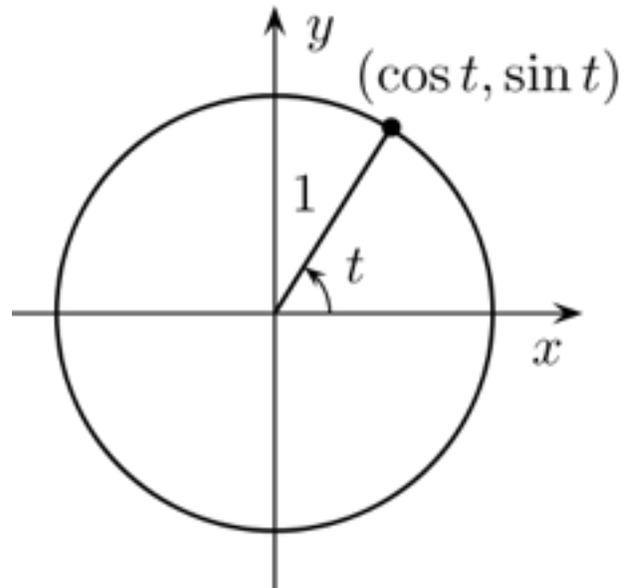
deg	t	sin	cos
0°	0	0	1
30°	$\dfrac{\pi}{6}$	$\dfrac{1}{2}$	$\dfrac{\sqrt{3}}{2}$
45°	$\dfrac{\pi}{4}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{2}}{2}$
60°	$\dfrac{\pi}{3}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{1}{2}$
90°	$\dfrac{\pi}{2}$	1	0

Memory Device					
[0,1]	$\dfrac{\sqrt{0}}{2}$	$\dfrac{\sqrt{1}}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{4}}{2}$

Graphs of Functions

Degree	Equation	Function	Graph
0	$y = k$	constant	horizontal straight line
1	$y = mx + b$	linear	straight line with slope m
2	$y = ax^2 + bx + c$	quadratic	parabola
n	$y = a_n x^n + a_{n-1} x^{n-1} + ... + a_1 x + a_0$	polynomial	smooth curves

Transformation	Function	Domain
shift up	$y = f(x) + k$	
shift down	$y = f(x) - k$	
shift left	$y = f(x + h)$	
shift right	$y = f(x - h)$	
vertically stretch	$y = af(x)$	$for\ a > 1$
vertically compress	$y = af(x)$	$for\ 0 < a < 1$
horizontally stretch	$y = f(ax)$	$for\ a > 0$
horizontally compress	$y = f(ax)$	$for\ 0 < a < 1$

Derivatives

Derivative Notation
$$\left(\frac{d}{dx}\right)^n y(x) = \frac{d^n y}{dx^n}.$$

Definition of the Derivative
$$\frac{df}{dx} = \lim_{\Delta x \to 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$$ $$= \lim_{h \to 0} \frac{f(x + h) - f(x)}{h}$$ $$= \lim_{\Delta x \to 0} \frac{\Delta y}{\Delta x}.$$

y	dy/dx
c	0
cx	c
$cf(x)$	$c\frac{d}{dx}f(x)$
$f(x) + g(x)$	$\frac{d}{dx}f(x) + \frac{d}{dx}g(x)$
cx^n	cnx^{n-1}