MATH 32 MIDTERM 2 REVIEW 9 Nov 08

Graphing Basics

- $x \longmapsto x + c$ shift $\overset{c}{\leftarrow}$

  $f(x) \longmapsto f(x) + d$ shift $\uparrow d$

  $x \longmapsto bx$ contract $\succ\!\!-\!\!\prec$ b

  $f(x) \longmapsto a f(x)$ expand $\updownarrow a$

  negative shift = other direction.
  negative contract/expand = reflect.

- plot points and guess: will be similar to a basic shape.

More Facts

$2^{10} = 1024 \approx 10^3$

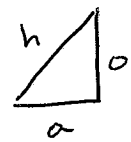
$\pi \approx 3.14$ $e \approx 2.72$

Cont's compound: Pe^{rt}, P = principle

r = nominal rate/100%

t = time in yrs.

$P(1+\frac{r}{n})^{nt}$ compound n times per yr.

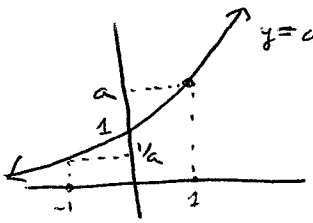


$\sin = \frac{o}{h}$

$\cos = \frac{a}{h}$

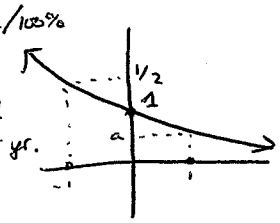
$\tan = \frac{o}{a}$

Basic Graphs



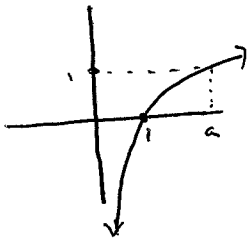
$y = a^x$, $a > 1$

doubling time $= \frac{\log 2}{\log a} = \log_a 2$.



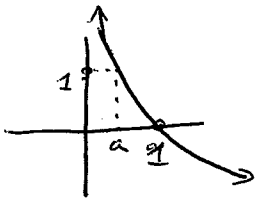
$y = a^x$, $0 < a < 1$

half-life $= \log_a 1/2 = \frac{\log 2}{\log(1/a)}$.



$y = \log_a x$

$a > 1$



$y = \log_a x$

$a < 1$

Facts

$A^{BC} = (A^B)^C$

$A^{B+C} = A^B A^C$

$(AB)^C = A^C B^C$

$A^{-1} = \frac{1}{A}$, etc.

$\log_A B = \frac{\log_C B}{\log_C A}$

$\log(A \cdot B) = \log A + \log B$

$\log(A^B) = B \cdot (\log A)$

$A^{\log_A B} = B$. $\log_A A = 1$.

$\log 1 = 0$.

Domain[log] = range[exp] = $(0, \infty)$.

$x^0 = x \cdot \frac{\pi}{180}$ radians.

$\sin -x = -\sin x$

$\cos -x = \cos x$

$\sin x = \cos(\frac{\pi}{2} - x)$

$\cos x = \sin(\frac{\pi}{2} - x)$

$\sin x = \sin(\pi - x)$

$\sin(x + 2\pi) = \sin x$

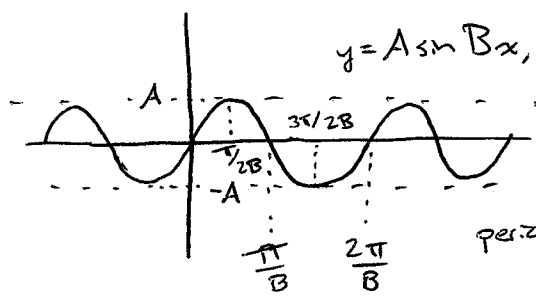
$\cos(x + 2\pi) = \cos x$

$\sin^2 x + \cos^2 x = 1$

$\tan x = \frac{\sin x}{\cos x}$

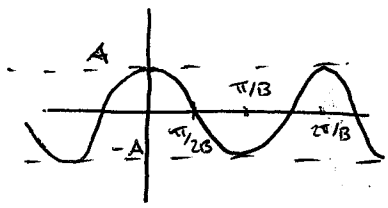
$\sec x = \frac{1}{\cos x}$

$\csc x = \frac{1}{\sec x}$.



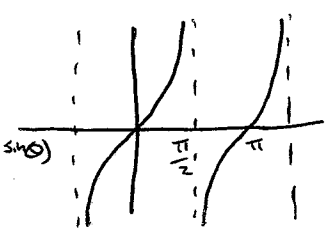
$y = A \sin Bx$, $A, B > 0$

period $= \frac{2\pi}{B}$



$y = A \cos Bx$

$A, B > 0$

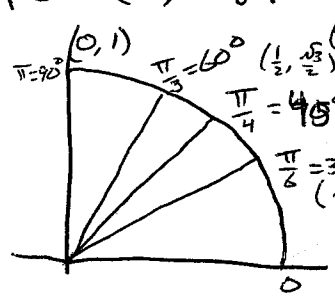


$y = \tan x$

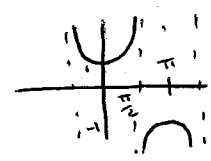
Area(a, b, θ) $= \frac{1}{2} ab \sin\theta$

Area(r, θ, r) $= \frac{1}{2}\theta r^2$

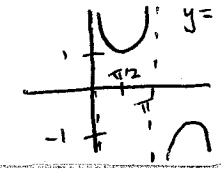
↑ in radians.



$(x, y) = (\cos\theta, \sin\theta)$



$y = \sec x$



$y = \csc x$