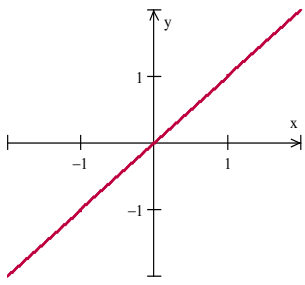


The Inexcusable Algebra Mistakes of Calculus

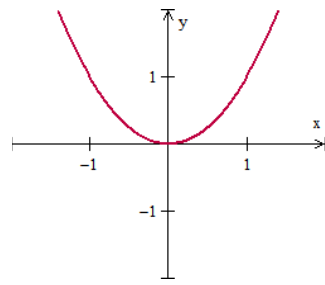
This reference sheet shows some common errors that occur in Calculus, along with twelve basic functions that you should know and understand without any aids.

COMMON ERRORS: NON-NEGOTIABLE BASIC SKILLS	
Example	Algebraic Property
$(x + 9)^2 \neq x^2 + 81$	$(A \pm B)^2 = A^2 \pm 2AB + B^2$
$\sqrt{x^2 + 81} \neq x + 3$	$\sqrt{(x + a)^2} = x + a $
$\frac{x + 5}{x} = 1 + \frac{5}{x}$ but $\frac{x}{x + 5} \neq 1 + \frac{1}{5}x$	$\frac{A \pm B}{C} = \frac{A}{C} \pm \frac{B}{C}$
$\frac{\frac{2+x}{5}}{3} = \frac{2+x}{15}$ not $\frac{\frac{2+x}{5}}{3} \neq \frac{6+3x}{5}$	$\frac{\frac{A}{B}}{C} = \frac{A}{BC}$
$4x^{-3} = \frac{4}{x^3}$ and $(4x)^{-3} = \frac{1}{64x^3}$	$b^{-n} = \frac{1}{b^n}$ and $\frac{1}{b^{-n}} = b^n$
FUNDAMENTAL ALGEBRAIC FOUNDATIONS	
<p>What defines a line? A POINT & A SLOPE</p> <p>If $m = -3$ and $(2, 7)$ is on the line then an equation of the line is:</p> $y - 7 = -3(x - 2)$	$y_2 - y_1 = m(x_2 - x_1)$
Factoring Basics	$A^2 - B^2 = (A + B)(A - B)$ $A^2 + B^2 = \text{relatively prime}$ $A^3 + B^3 = (A + B)(A^2 - AB + B^2)$ $A^3 - B^3 = (A - B)(A^2 + AB + B^2)$
Basic Trigonometric Values for $[0, 2\pi]$	$\sin^2 \theta + \cos^2 \theta = 1$ $1 + \cot^2 \theta = \csc^2 \theta$ $\tan^2 \theta + 1 = \sec^2 \theta$
<p>Communicating solutions through written mathematical expressions.</p>	

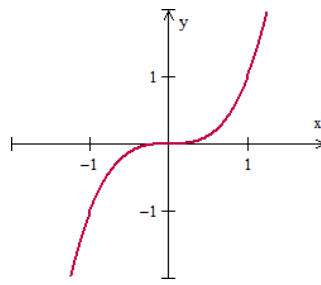
Twelve Basic Functions



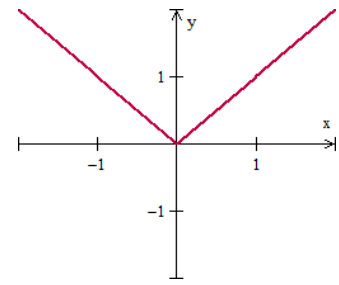
$$y = x$$



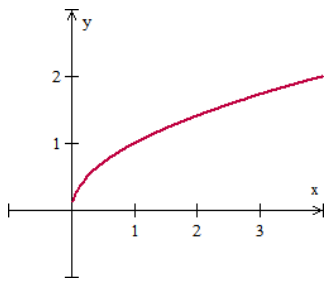
$$y = x^2$$



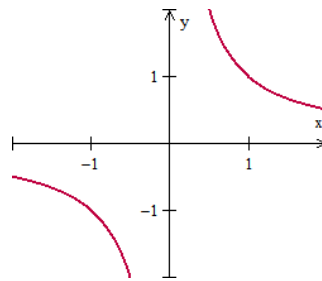
$$y = x^3$$



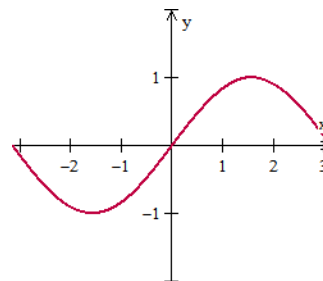
$$y = |x|$$



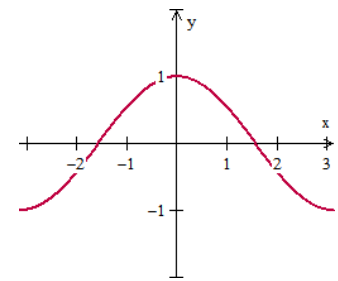
$$y = \sqrt{x}$$



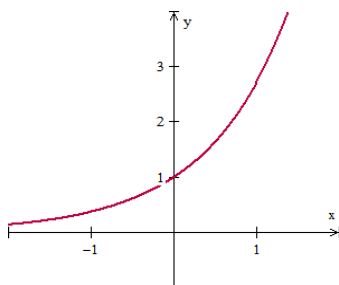
$$y = \frac{1}{x}$$



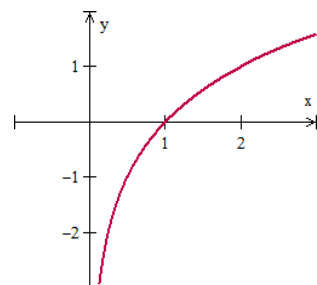
$$y = \sin x$$



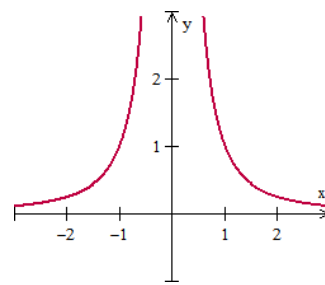
$$y = \cos x$$



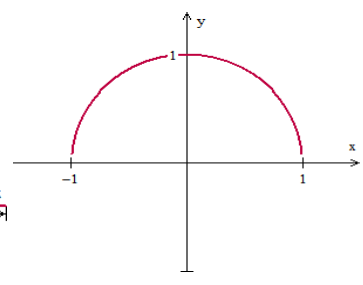
$$y = e^x$$



$$y = \ln x$$



$$y = \frac{1}{x^2}$$



$$y = \sqrt{a^2 - x^2}$$