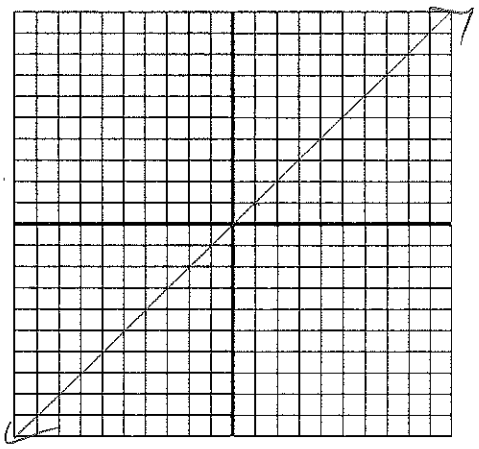
Function: The Identity Function

$f(x) = x$

Graph:



Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Inc./Dec./Cons.: $(-\infty, \infty)$ Always Increasing

Pos./Neg./Zero: $(0, \infty)^{+}$ $(-\infty, 0)^{-}$ $x = 0$

Continuity: Continuous $(-\infty, \infty)$

Bnd: None

Sym: odd function origin

Extr: None

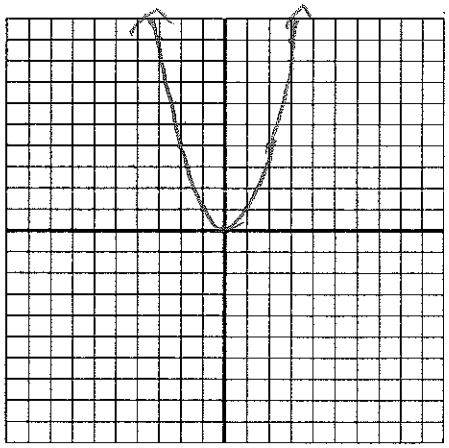
Asymp: None

EB: $\lim_{x \to -\infty} f(x) = -\infty$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Squaring Function

$y = x^2$

Graph:



Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Inc./Dec./Cons.: $(-\infty, 0)^{\text{Dec.}}$ $(0, \infty)^{\text{I}}$

Pos./Neg./Zero: $(-\infty, 0)^{+} \cup (0, \infty)$ $x = 0$

Continuity: Continuous $(-\infty, \infty)$

Bnd: Below by $y = 0$

Sym: Even function

Extr: Abs. Min. $y = 0$ @ $x = 0$

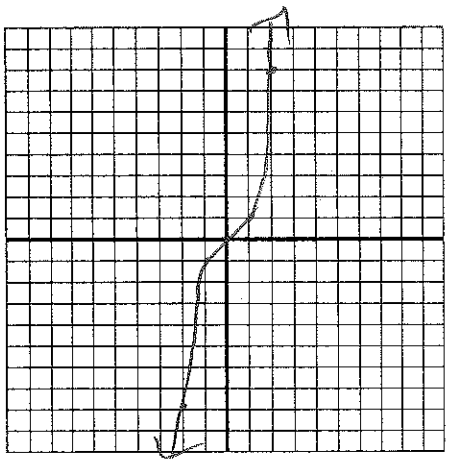
Asymp: None

EB: $\lim_{x \to -\infty} f(x) = \infty$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Cubic Function

$y = x^3$

Graph:



Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Inc./Dec./Cons.: $(-\infty, \infty)$ Increasing

Pos./Neg./Zero: $(-\infty, 0)$ $(0, \infty)$ $x = 0$

Continuity: Continuous $(-\infty, \infty)$

Bnd: No Bound

Sym: Odd function origin

Extr: No Extrema

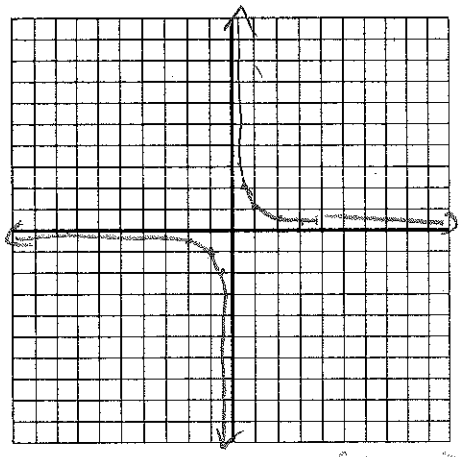
Asymp: None

EB: $\lim_{x \to -\infty} f(x) = -\infty$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Reciprocal Function

$f(x) = \frac{1}{x}$

Graph:



Domain: $(-\infty, 0) \cup (0, \infty)$

Range: $(-\infty, 0) \cup (0, \infty)$

Inc./Dec./Cons.: $(-\infty, 0)$, $(0, \infty)$ Decreasing

Pos./Neg./Zero: $(-\infty, 0)$, $(0, \infty)$

$(-\infty, 0) \cup (0, \infty)$

Continuity: VA @ $x = 0$

Bnd: Not Bounded

Sym: Odd function origin

Extr: No Extrema

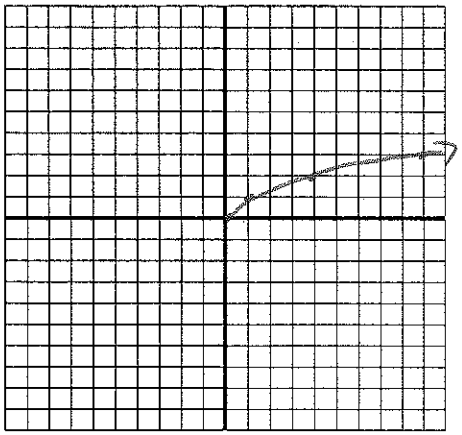
Asymp: VA @ $x = 0$ HA @ $y = 0$

EB: $\lim_{x \to -\infty} f(x) = 0$ $\lim_{x \to \infty} f(x) = 0$

Function: The Square Root Function

$f(x) = \sqrt{x}$

Graph:



Domain: $[0, \infty)$

Range: $[0, \infty)$

Inc./Dec./Cons.: $(0, \infty)$ Increasing.

Pos./Neg./Zero: $(0, \infty)$ $x = 0$

Continuity: Continuous $[0, \infty)$

Bnd: Lower Bound @ $y = 0$

Sym: Not Symmetric

Extr: Abs Min @ $y = 0$ @ $x = 0$

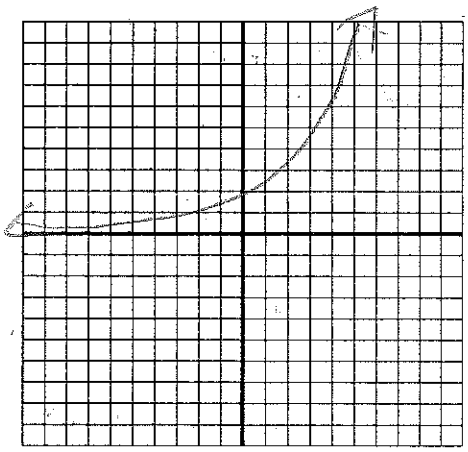
Asymp: No Asym.

EB: $\lim_{x \to \infty} f(x) = \infty$

Function: Exponential

$y = e^x$

Graph:



Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

Inc./Dec./Cons.: I: $(-\infty, \infty)$

Pos./Neg./Zero: P: $(-\infty, \infty)$

Continuity: Continuous $(-\infty, \infty)$

Bnd: Lower bound $y = 0$

Sym: Not Symmetric

Extr: No Extremes

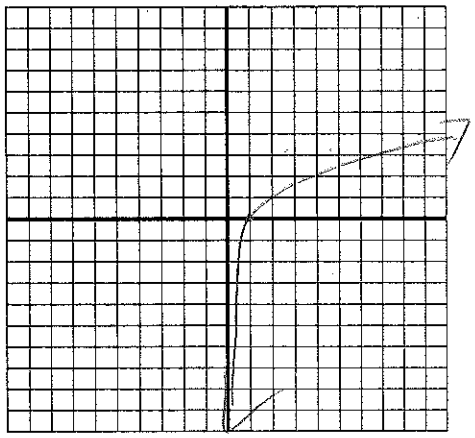
Asymp: $y = 0$

EB: $\lim_{x \to -\infty} f(x) = 0$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Natural Log Function

$f(x) = \ln(x)$

Graph:



Domain: $(0, \infty)$

Range: $(-\infty, \infty)$

Inc./Dec./Cons.: I: $(0, \infty)$

Pos./Neg./Zero: $(0, 1)$ $(1, \infty)$ z: $x = 1$

Continuity: Continuous $(0, \infty)$

Bnd: No Bound

Sym: Not Symmetric

Extr: No Extrema

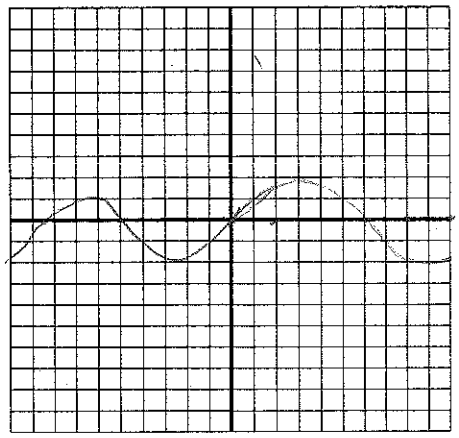
Asymp: VA @ $x = 0$

EB: $\lim_{x \to \infty} f(x) = \infty$

Function: The Sine Function

$f(x) = \sin x$

Graph:



Domain: $(-\infty, \infty)$

Range: $[-1, 1]$

Inc./Dec./Cons.: I: $\left((4n-1)\frac{\pi}{2}, (4n+1)\frac{\pi}{2}\right)$

D: $\left((4n+1)\frac{\pi}{2}, (4n+3)\frac{\pi}{2}\right)$

z: πn

Pos./Neg./Zero: P: $(2\pi n, (2n+1)\pi)$ N: $((2n+1)\pi, (2n+2)\pi)$

Continuity: Continuous $(-\infty, \infty)$

Bnd: LB: $y = -1$ UB: $y = 1$

Sym: odd function origin

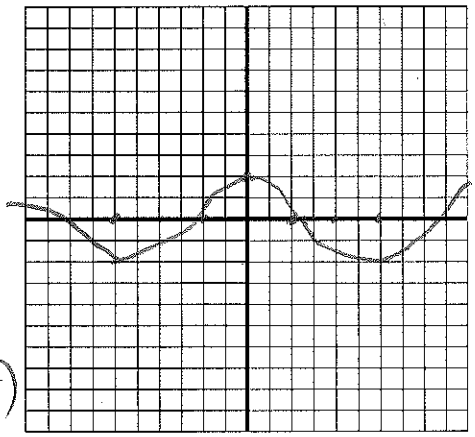
Extr: Abs. Max @ $\frac{\pi}{2}(4n+1)$ Abs. Min @ $\frac{\pi}{2}(4n-1)$

Asymp: none

EB: $\lim_{x \to \pm\infty} f(x)$ oscillates between -1 & 1

Function: The Cosine Function
$f(x) = \cos x$

Graph:



Domain: $(-\infty, \infty)$

Range: $[-1, 1]$

Inc./Dec./Cons.: $I: ((2n-1)\pi, 2\pi n)$ $D: (2\pi n, (2n+1)\pi)$
$N: ((4n+1)\frac{\pi}{2}, (4n+3)\frac{\pi}{2})$

Pos./Neg./Zero: $P: ((4n-1)\frac{\pi}{2}, (4n+1)\frac{\pi}{2})$ $Z: \frac{\pi}{2}(2n+1)$

Continuity: Continuous $(-\infty, \infty)$

Bnd: Above: $y=1$ Below: $y=-1$
Abs min @ $y=-1$ @ $x=\pi(2n+1)$

Sym: Even Function y-axis

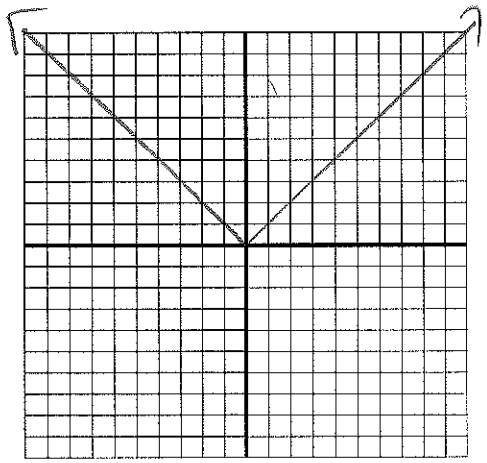
Extr: Abs Max @ $y=1$ @ $x=2\pi n$

Asymp: None

EB: $\lim_{x \to \pm\infty} f(x)$: oscillates between $y=-1$ & $y=1$

Function: The Absolute Value Function
$y = |x|$

Graph:



Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Inc./Dec./Cons.: $I: (0, \infty)$ $D: (-\infty, 0)$
$Z: @\ x=0$

Pos./Neg./Zero: $P: (-\infty, 0) \cup (0, \infty)$

Continuity: Continuous $(-\infty, \infty)$

Bnd: lower bound @ $y=0$

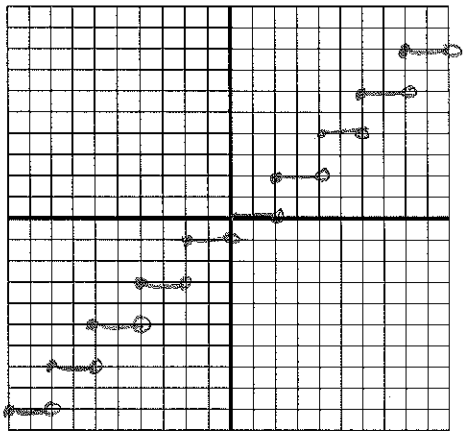
Sym: Even y-axis

Extr: Abs. min $y=0$ @ $x=0$

Asymp: none

EB: $\lim_{x \to -\infty} f(x) = \infty$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Greatest Integer Function $f(x) = \lfloor x \rfloor$ **Graph:**



Domain: $(-\infty, \infty)$

Range: All integers

Inc./Dec./Cons.: Constant on $(-\infty, \infty)$

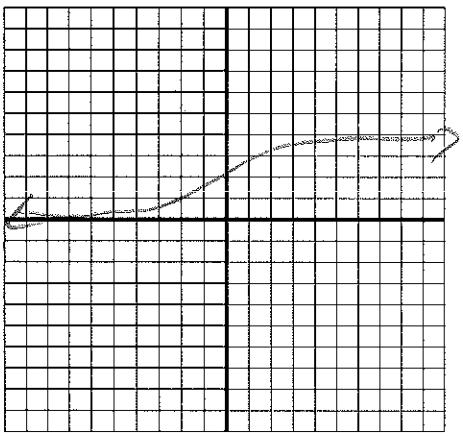
Pos./Neg./Zero: P: $[1, \infty)$ N: $(-\infty, -1]$ Z: $[0,1)$ Continuity: Discontinuity @ each integer

Bnd: None Sym: Neither

Extr: None Asymp: None

EB: $\lim_{x \to -\infty} f(x) = -\infty$ $\lim_{x \to \infty} f(x) = \infty$

Function: The Logistic Function $f(x) = \frac{1}{1+e^{-x}}$ **Graph:**



Domain: $(-\infty, \infty)$

Range: $(0, 1)$

Inc./Dec./Cons.: I: $(-\infty, \infty)$

Pos./Neg./Zero: P: $(-\infty, \infty)$ Continuity: Continuous: $(-\infty, \infty)$

Bnd: Below @ $y=0$ Above @ $y=1$ Sym: None

Extr: None Asymp: HA @ $y=0$, $y=1$

EB: $\lim_{x \to -\infty} f(x) = 0$ $\lim_{x \to \infty} f(x) = 1$