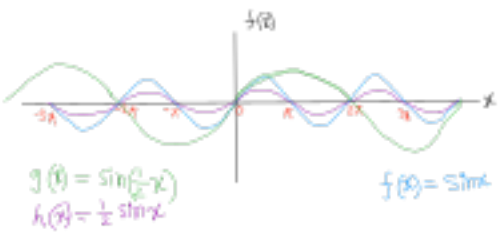


Symmetry Test:

$y=f(x)=x^2$

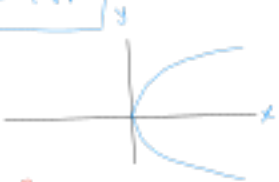
Replacing "x" by "-x" then we find $y=f(-x)=(-x)^2$

$\Rightarrow y=x^2$

$y^2=x \Rightarrow y=f(x)=\pm\sqrt{x}$

Replacing "y" by "-y" we find $-y=\pm\sqrt{x}$

$\Rightarrow \boxed{y=\mp\sqrt{x}}$



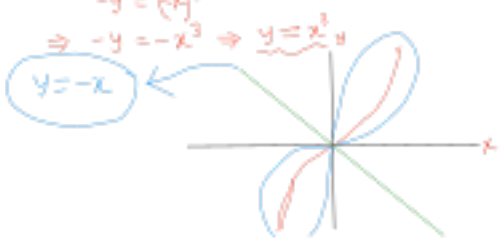
$y=f(x)=x^3$

Replacing "x" and "y" by "-x" and "-y", respectively, we find

$-y=(-x)^3$

$\Rightarrow -y=-x^3 \Rightarrow y=x^3$

$y=-x$



1. Even function: $f(-x)=f(x)$
2. Odd function: $f(-x)=-f(x)$
3. Neither Even nor Odd

Family of functions:

$y=f(x)=x^n$

$n=1,2,3,4,\dots$

$y=x$ $\quad y=x^2$ $\quad y=x^3$

$y=f(x)=\sin x$

$y=f(x)=ax$

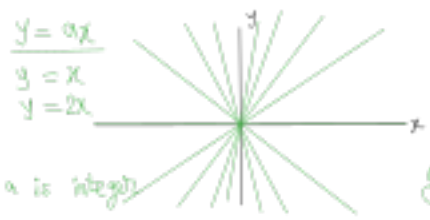
$a=1,2,3,4,\dots$

$y=ax$

$y=x$

$y=2x$

a is integer



$a=0$

$y=0$

$y=2x$

$y=x$

(0,1)

$x\approx 0$

$y=ax$

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

$y=x^n$

$n=1 \Rightarrow$

$n=2 \Rightarrow$

$y=x$

$y=x^2$

$y=x^3$

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

$y=x-4$

$y=x^2$

0.0060235

Logarithmic and exponential functions:

23456

23.458×10^3

$y=f(x)=a^x$

$a>0$

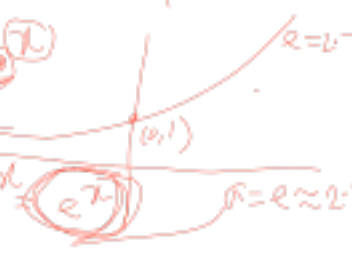
$D_f=(-\infty,\infty)$

$R_f=(0,\infty)$

$f(x)=2^x$

x	y
0	1
-1	0.5
1	2
2	4
-2	0.25

$f(x)=e^x$



$f(x)=a^x$ $\quad e^x$ $\quad e=2.72$

$f(x)=\log_a x$

Logarithm of "x" to the base "a".

$a=10$ $\quad a=e$

$\log_{10} x$ $\quad \log x$ $\quad \log_e x$ $\quad \ln x$

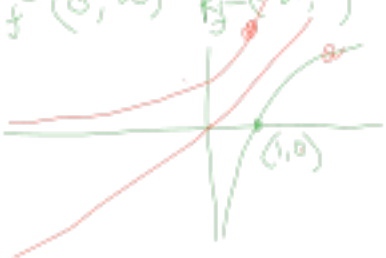
Common logarithm $\quad$ N Natural logarithm

$\log_z x=\frac{\ln x}{\ln z}$ $\quad \ln x$

$f(x)=\log_a x$

$D_f=(0,\infty)$ $\quad R_f=(-\infty,\infty)$

$f(x)=\ln x$



$y=e^x \Longrightarrow$

$y=a^x$ $\quad \rightarrow \quad x=\ln y$

$\log_a x=y$

$a^y=x$

$2^3=8$ $\quad \rightarrow \quad \log_2 8=3$

$D_f=\mathbb{R}-\{1\}$

$R_f=$ $f(x)=\frac{1+x}{1-x}$ $\quad g(x)=\frac{x}{1-x}$

$f\circ g(x)=f(g(x))=$