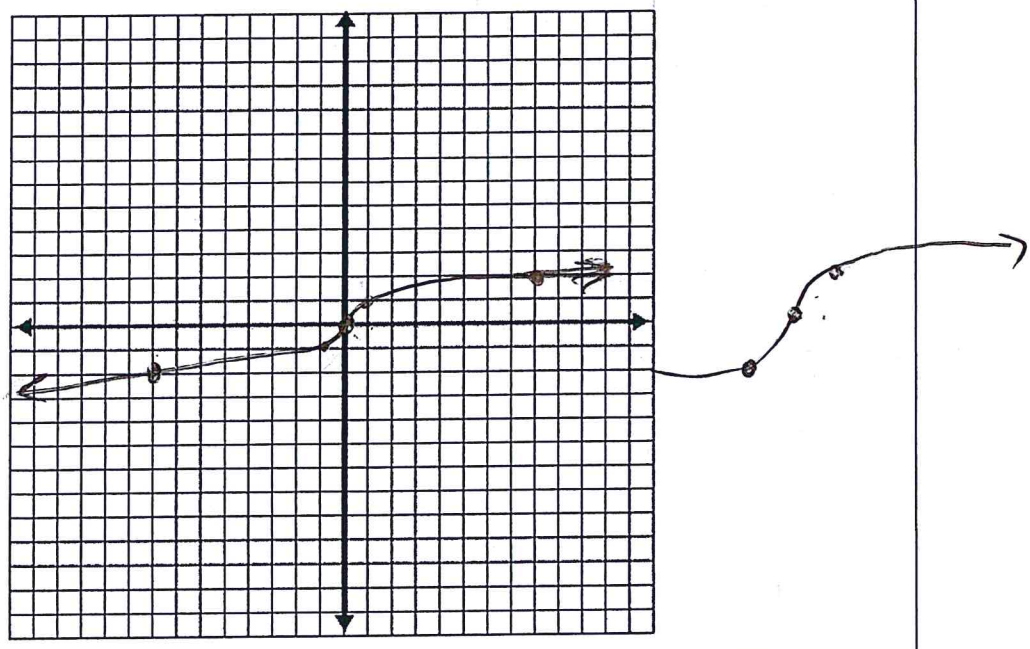
Polynomial odd + radical odd are inverses

Radical
(Odd)
Example: f(x) = $\sqrt[3]{x}$

Table of Values
choose two positive, two negative and zero for values of x

x	y
-8	-2
-1	-1
0	0
1	1
8	2

Sketch:



f(x)=	
Domain (interval)	$(-\infty, \infty)$
Range (interval)	$(-\infty, \infty)$
Increasing (interval)	$(-\infty, \infty)$
Decreasing (interval)	— | constant —
X-Intercept(s)	(0,0)
Y-Intercept(s)	(0,0)
Asymptotes	—
End behavior	L: As $x \to -\infty$, $y \to -\infty$ R: As $x \to \infty$, $y \to \infty$

Additional info:

$2^x \neq 0$

$f(x) = b^x \quad b > 1$

Exponential Growth

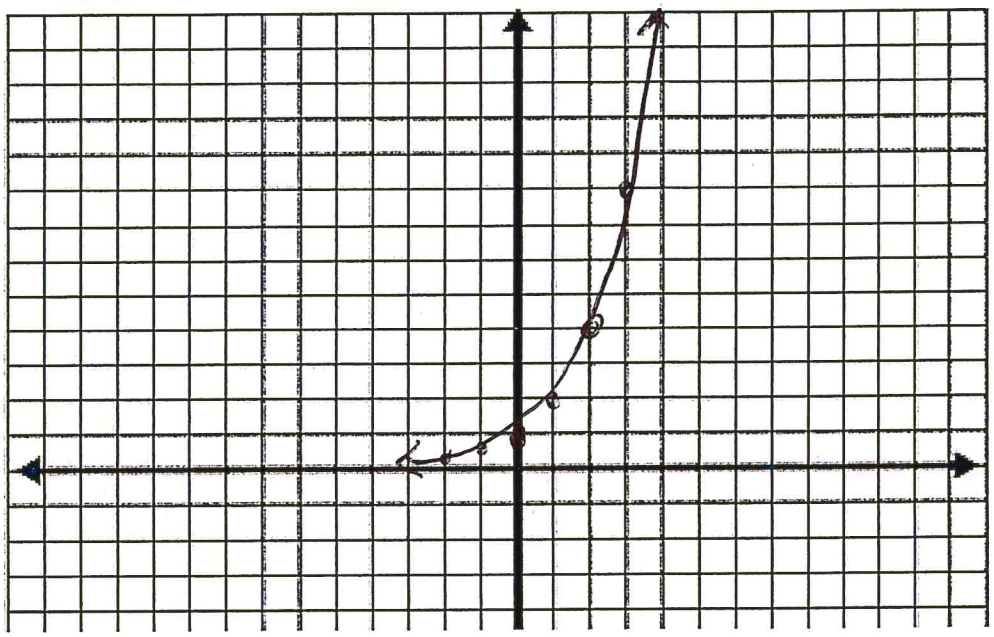
Example: $f(x) = 2^x$

Table of Values

choose two positive, two negative and zero for values of x

x	y
-2	$2^{-2} = \frac{1}{4}$
-1	$2^{-1} = \frac{1}{2}$
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$

Sketch:



$f(x) = 2^x$	
Domain (interval)	$(-\infty, \infty)$
Range (interval)	$(0, \infty)$
Increasing (interval)	$(-\infty, \infty)$
Decreasing (interval)	— | constant —
X-Intercept(s)	—
Y-Intercept(s)	$(0, 1)$
Asymptotes HA	$y = 0x + 0$ x-axis $y = 0$
End behavior	L: As $x \to -\infty$, $y \to 0$ R: As $x \to \infty$, $y \to \infty$

Additional info:

$0<b<1$ Decay

Exponential Decay

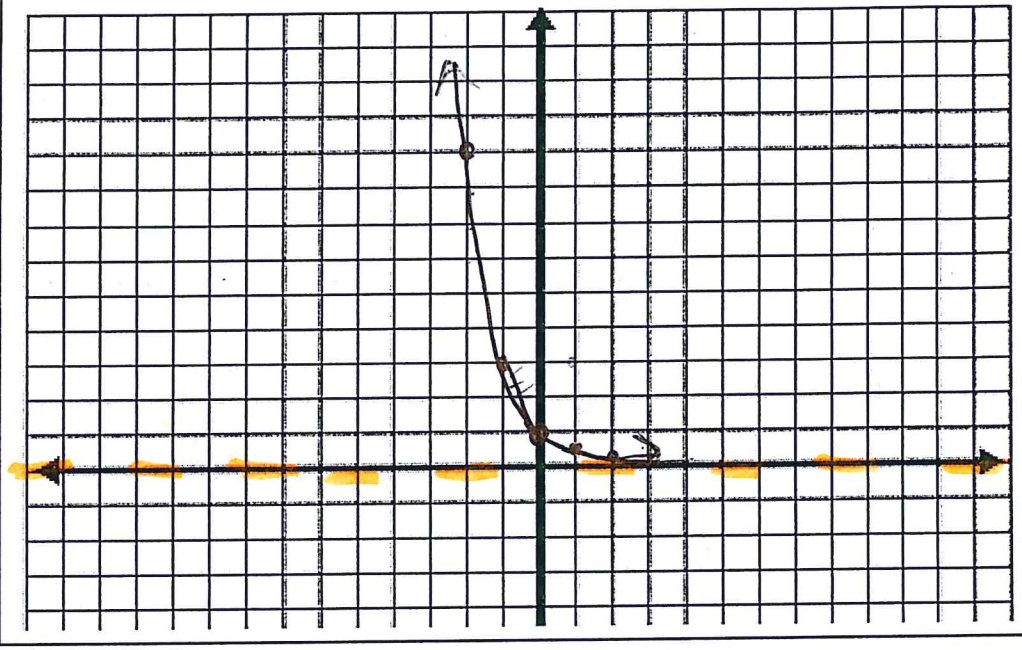
$f(x)=\left(\frac{1}{3}\right)^x$

Table of Values

choose two positive, two negative and zero for values of x

x	y
-2	$\left(\frac{1}{3}\right)^{-2}=9$
-1	$\left(\frac{1}{3}\right)^{-1}=3$
0	$\left(\frac{1}{3}\right)^{0}=1$
1	$\left(\frac{1}{3}\right)^{1}=\frac{1}{3}$
2	$\left(\frac{1}{3}\right)^{2}=\frac{1}{9}$

Sketch:



Domain (interval)	$(-\infty,\infty)$
Range (interval)	$(0,\infty)$
Increasing (interval)	—
Decreasing (interval)	$(-\infty,\infty)$ | constant —
X-Intercept(s)	—
Y-Intercept(s)	$(0,1)$
Asymptotes HA	at $\boxed{y=0}$ (x-axis)
End behavior	L: As $x\to-\infty$, $y\to\infty$ R: As $x\to\infty$, $y\to 0$

Additional info:

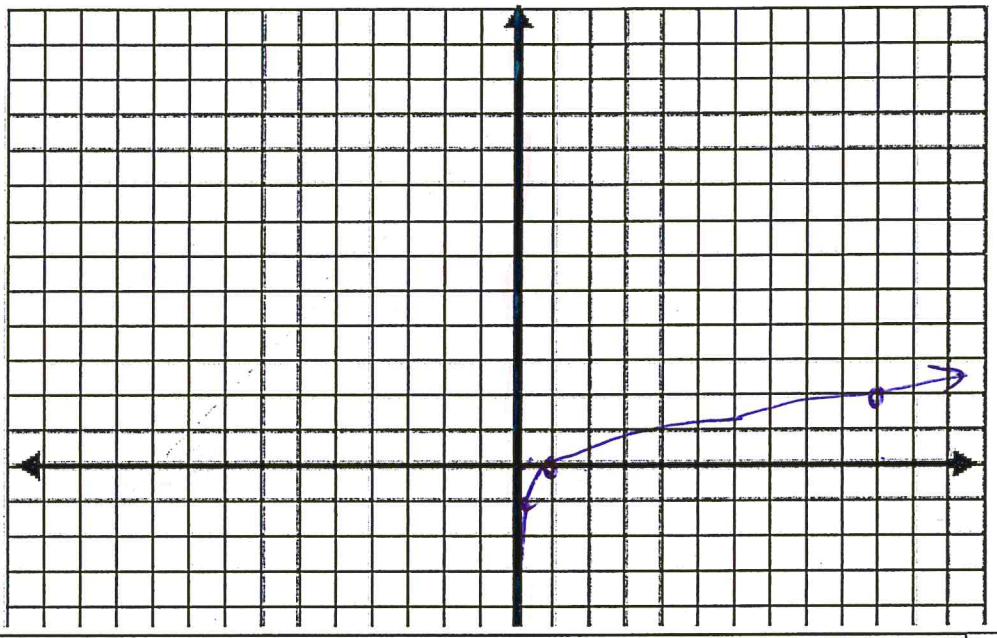
Addl info: Logs are inverses of exponentials $\log_{10} x$ Common log

Logarithm
f(x) = logx

Table of Values
choose two positive, two negative and zero for values of x

x	y
$\frac{1}{100}$	-2
$\frac{1}{10}$	-1
1	0
10	1
100	2

Sketch:



Domain (interval)	$(0, \infty)$
Range (interval)	$(-\infty, \infty)$
Increasing (interval)	$(0, \infty)$
Decreasing (interval)	— | constant —
X-Intercept(s)	(1,0)
Y-Intercept(s)	—
Asymptotes VA	at $x=0$ (y-axis)
End behavior: L:	As $x \to 0, y \to -\infty$
R:	As $x \to \infty, y \to \infty$

Additional info: