

Polynomial (Cubic)

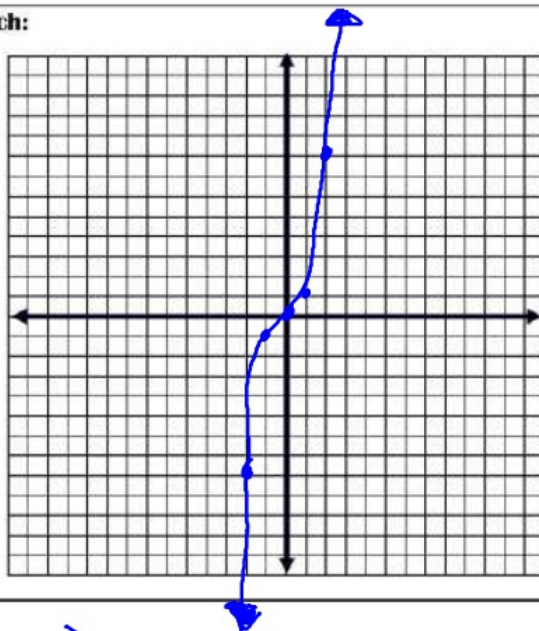
$$f(x) = x^3$$

Table of Values

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

x	y
-2	$(-2)^3 = -8$
-1	$(-1)^3 = -1$
0	$(0)^3 = 0$
1	$(1)^3 = 1$
2	$(2)^3 = 8$

Sketch:



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

Domain
(interval)

$$(-\infty, +\infty)$$

Range
(interval)

$$(-\infty, +\infty)$$

Increasing
(interval)

$$(-\infty, +\infty)$$

Decreasing
(interval)

none

Intercepts

$(0,0)$ both x and y-int.

Asymptotes

none

End behavior

L: $x \rightarrow -\infty$ $y \rightarrow -\infty$ R: $x \rightarrow +\infty$ $y \rightarrow +\infty$

Positive

$$(0, +\infty)$$

Negative

$$(-\infty, 0)$$

Max/Min

none

Symmetry

odd

Additional info:

One arrow points up and one points down.

Radical (Square Root)

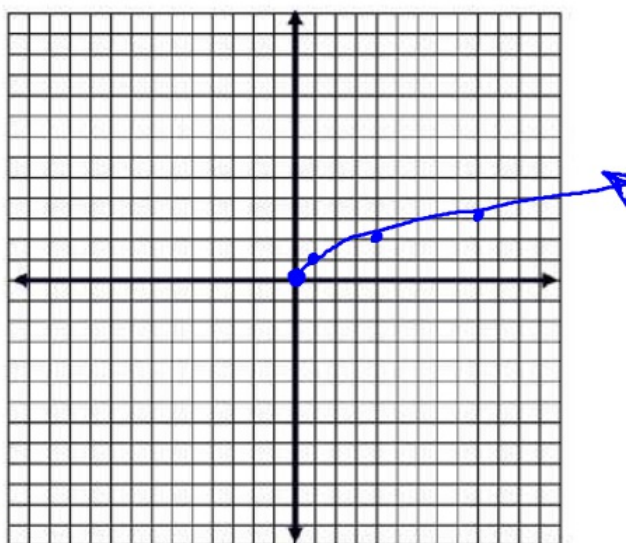
$$f(x) = \sqrt{x}$$

Table of Values

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

x	y
9	$\sqrt{9} = 3$
4	$\sqrt{4} = 2$
1	$\sqrt{1} = 1$
0	$\sqrt{0} = 0$
-1	$\sqrt{-1} = \text{undef}$

Sketch:



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

Domain
(interval)

$$[0, +\infty)$$

Range
(interval)

$$[0, +\infty)$$

Increasing
(interval)

$$(0, +\infty)$$

Decreasing
(interval)

none

Intercepts

(0,0) both x and y-int

Asymptotes

none

End behavior

L: N/A R: $x \rightarrow +\infty$ $y \rightarrow +\infty$

Positive

$$(0, +\infty)$$

Negative

none

Max/Min

mini: (0,0)

Symmetry

none

Additional info:

Square root starts from the origin

Radical (Cubic Root)

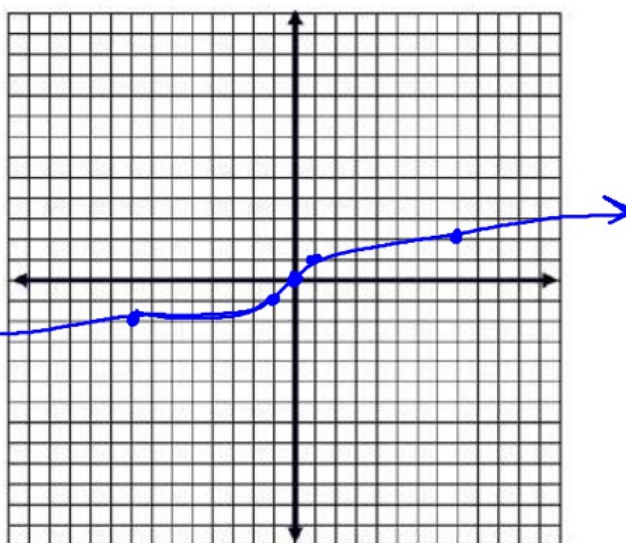
$$f(x) = \sqrt[3]{x}$$

Table of Values

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

x	y
-8	$\sqrt[3]{-8} = -2$
-1	$\sqrt[3]{-1} = -1$
0	$\sqrt[3]{0} = 0$
1	$\sqrt[3]{1} = 1$
8	$\sqrt[3]{8} = 2$

Sketch:



$$f(x) = \sqrt[3]{x}$$

Domain
(interval)

$$(-\infty, +\infty)$$

Range
(interval)

$$(-\infty, +\infty)$$

Increasing
(interval)

$$(-\infty, +\infty)$$

Decreasing
(interval)

None

Intercepts

(0,0) both x and y-int

Asymptotes

None

End behavior

L: $x \rightarrow -\infty$ $y \rightarrow -\infty$ R: $x \rightarrow +\infty$ $y \rightarrow +\infty$

Positive

$$(0, +\infty)$$

Negative

$$(-\infty, 0)$$

Max/Min

none

Symmetry

odd

Additional info:

one side points left, the other right

Exponential Growth

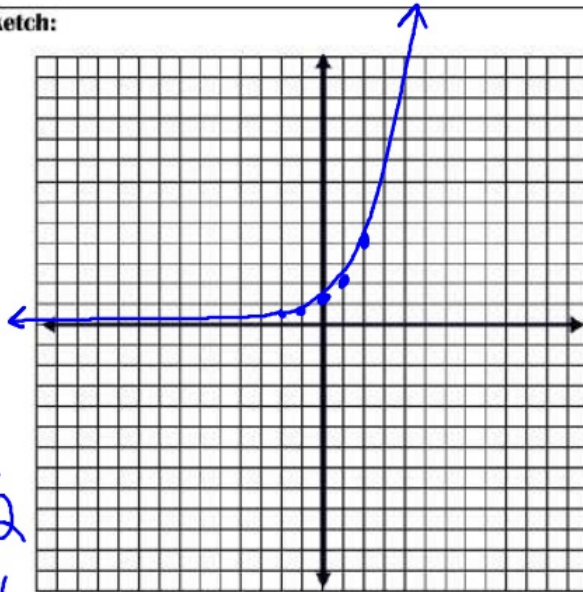
$f(x) = 2^x$

Table of Values

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

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

Sketch:



$f(x) = 2^x$

Domain
(interval)

$(-\infty, +\infty)$

Range
(interval)

$(0, +\infty)$

Increasing
(interval)

$(-\infty, +\infty)$

Decreasing
(interval)

None

Intercepts

$(0, 1)$ y-int

Asymptotes

$y = 0$

End behavior

L: $x \rightarrow -\infty$ $y \rightarrow 0$ R: $x \rightarrow +\infty$ $y \rightarrow +\infty$

Positive

$(-\infty, +\infty)$

Negative

none

Max/Min

none

Symmetry

none

Additional info:

A line that the graph gets
very close to but never
crosses is an asymptote.