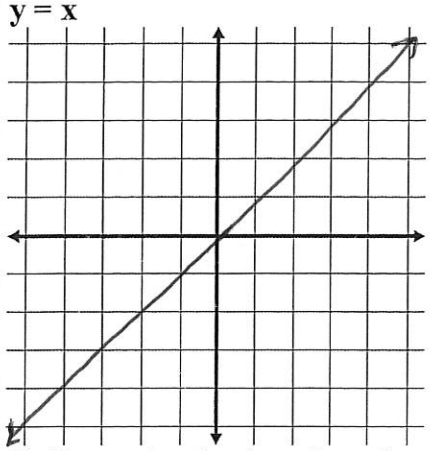
Sketch a graph of the following functions

$y = x$



1) Determine the domain and range

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

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

2) Is the function even, odd or neither

odd

3) Intervals of Increase or Decrease

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

4) Find any extrema.

None

5) Determine the end behavior

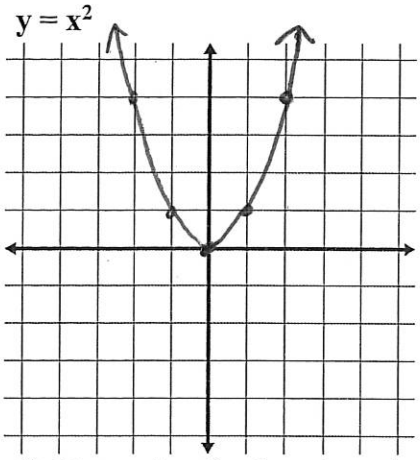
$\lim_{x \to -\infty} f(x) = y \to \infty$

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

6) Find any asymptotes

None

$y = x^2$



1) Determine the domain and range

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

R: $[0, \infty)$

2) Is the function even, odd or neither

Even

3) Intervals of Increase or Decrease

Dec: $(-\infty, 0)$

Inc: $(0, \infty)$

4) Find any extrema.

Abs Min $(0, 0)$

Local

5) Determine the end behavior

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

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

6) Find any asymptotes

None

Determine if each function is continuous. If the function is not continuous, find the x-axis location of each discontinuity and classify each discontinuity as infinite or removable. Also find any horizontal asymptotes.

A) $f(x)=\dfrac{3x^2+15x}{x+5}$

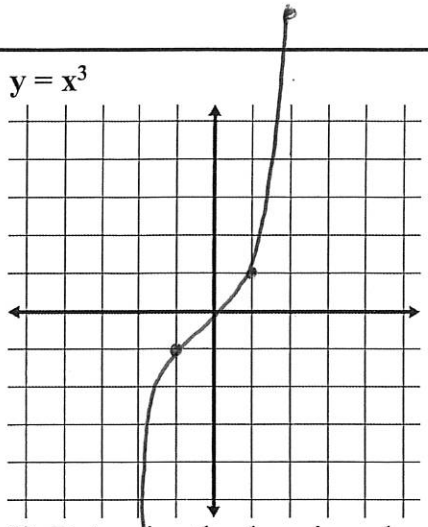
B) $f(x)=\dfrac{x^2+3x}{x+2}$

C) $f(x)=\dfrac{9x+6}{x^2-4}$

D) $f(x)=\dfrac{9x+18}{x^2-4}$

E) $f(x)=\dfrac{x-5}{x^2-4x-5}$

$y = x^3$



1) Determine the domain and range

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

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

2) Is the function even, odd or neither

odd

3) Intervals of Increase or Decrease

Inc $(-\infty, \infty)$

4) Find any extrema.

None

5) Determine the end behavior

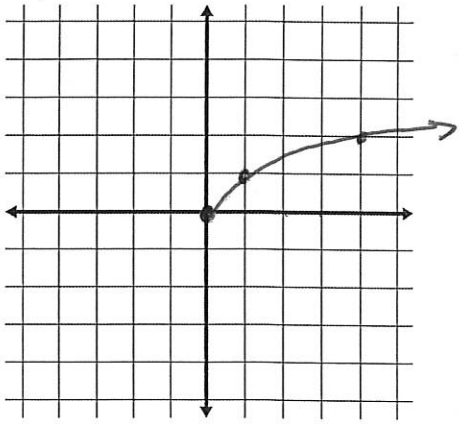
$x \to -\infty$ $y \to -\infty$

$x \to \infty$ $y \to \infty$

6) Find any asymptotes

None

$y = \sqrt{x}$



1) Determine the domain and range

D: $[0, \infty)$

R: $[0, \infty)$

2) Is the function even, odd or neither

Neither

3) Intervals of Increase or Decrease

Inc: $(0, \infty)$

4) Find any extrema.

Abs. min $(0, 0)$

5) Determine the end behavior

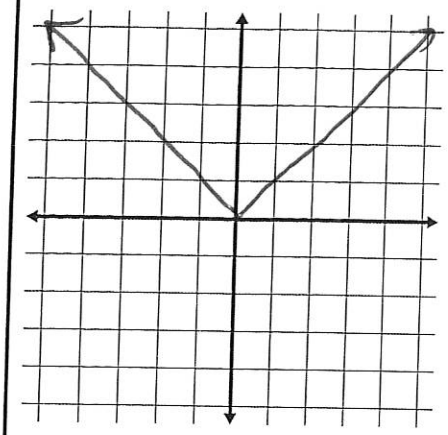
$x \to 0^+$ $y \to 0$

$x \to \infty$ $y \to \infty$

6) Find any asymptotes

None

$y = |x|$



1) Determine the domain and range

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

R: $[0, \infty)$

2) Is the function even, odd or neither

even

3) Intervals of Increase or Decrease

Dec: $(-\infty, 0)$

Inc: $(0, \infty)$

4) Find any extrema.

Abs Min: $(0,0)$

5) Determine the end behavior

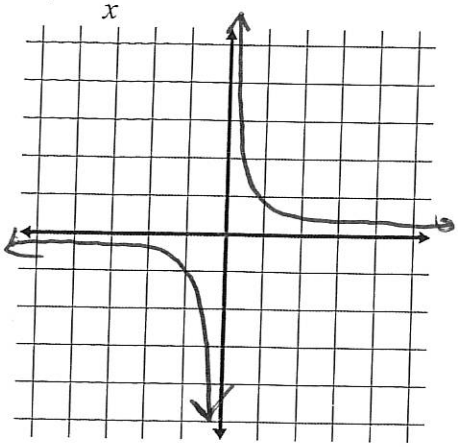
$x \to -\infty \quad y \to \infty$

$x \to \infty \quad y \to \infty$

6) Find any asymptotes

None

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



1) Determine the domain and range

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

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

2) Is the function even, odd or neither

odd

3) Intervals of Increase or Decrease

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

4) Find any extrema.

None

5) Determine the end behavior

$x \to -\infty \quad y \to 0$

$x \to \infty \quad y \to 0$

6) Find any asymptotes

VA: y-axis $(x=0)$

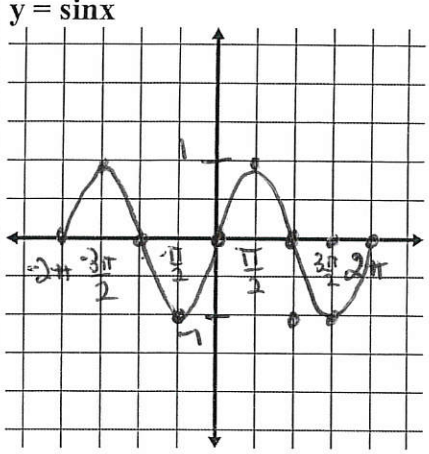
HA: x axis $(y=0)$

Infinite Intervals of Inc/Dec

$\left(\frac{3\pi}{2}, 2\pi\right)$

k is any integer

y = sinx



1) Determine the domain and range

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

R: $[-1, 1]$

2) Is the function even, odd or neither

odd

3) Intervals of Increase or Decrease

Inc: $\left(-\frac{\pi}{2}, \frac{3\pi}{2}\right) \cup \left(-2\pi, -\frac{3\pi}{2}\right)$

Dec: $\left(-\frac{3\pi}{2}, -\frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$

4) Find any extrema.

Max: $x = \frac{\pi}{2} \pm 2\pi k$

Min: $x = -\frac{\pi}{2} \pm 2\pi k$

5) Determine the end behavior

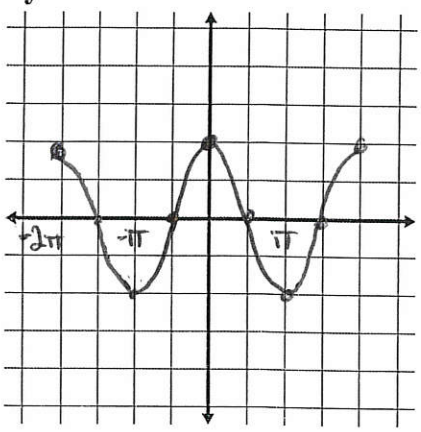
$x \to \pm\infty$ $y \to$ Between -1 and 1

DNE

6) Find any asymptotes

None

y = cosx



1) Determine the domain and range

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

R: $[-1, 1]$

2) Is the function even, odd or neither

even

3) Intervals of Increase or Decrease

Inc: $(-\pi, 0) \cup (\pi, 2\pi)$

Dec: $(-2\pi, -\pi) \cup (0, \pi)$

4) Find any extrema.

Max: $x = 0 \pm 2\pi k$

Min: $x = -\pi \pm 2\pi k$

5) Determine the end behavior

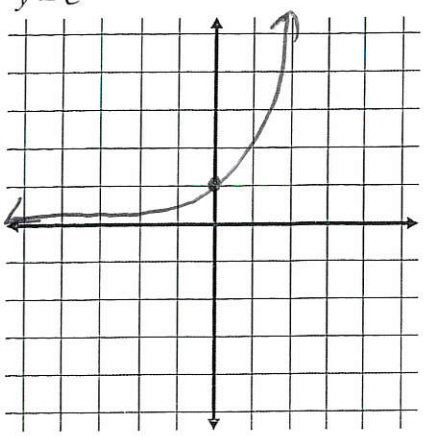
$x \to \pm\infty$ $y \to$ between -1 and 1

DNE

6) Find any asymptotes

None

$y = e^x$



1) Determine the domain and range

D: $(-\infty, 0)$

R: $(0, \infty)$

2) Is the function even, odd or neither

neither

3) Intervals of Increase or Decrease

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

4) Find any extrema.

None

5) Determine the end behavior

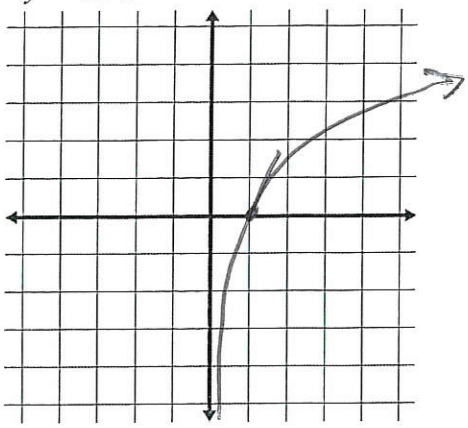
$x \to -\infty \quad y \to 0$

$x \to \infty \quad y \to \infty$

6) Find any asymptotes

HA: $y = 0$

$y = \ln x$



1) Determine the domain and range

D: $(0, \infty)$

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

2) Is the function even, odd or neither

Neither

3) Intervals of Increase or Decrease

Inc: $(0, \infty)$

4) Find any extrema.

None

5) Determine the end behavior

$x \to 0^+ \quad y \to -\infty$

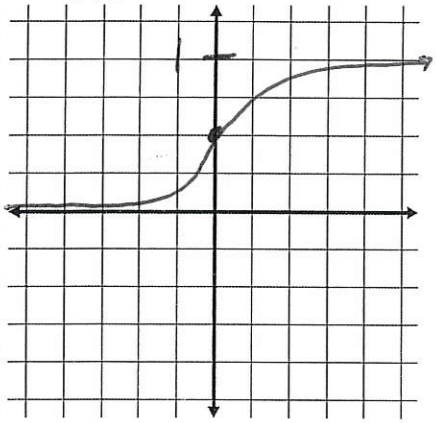
$x \to \infty \quad y \to \infty$

6) Find any asymptotes

~~None~~

VA. $x = 0$

$y = \frac{1}{1+e^{-x}}$



1) Determine the domain and range

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

R: $(0, 1)$

2) Is the function even, odd or neither

Neither

3) Intervals of Increase or Decrease

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

4) Find any extrema.

None

5) Determine the end behavior

$x \to -\infty \quad y \to 0$

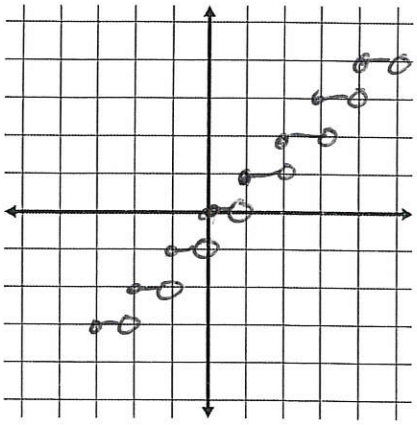
$x \to \infty \quad y \to 1$

6) Find any asymptotes

HA $y = 0$

$y = 1$

y = int(x)



1) Determine the domain and range

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

R: All integers

2) Is the function even, odd or neither

~~Odd~~ Neither

3) Intervals of Increase or Decrease

None

4) Find any extrema.

None

5) Determine the end behavior

$x \to -\infty \quad y \to -\infty$

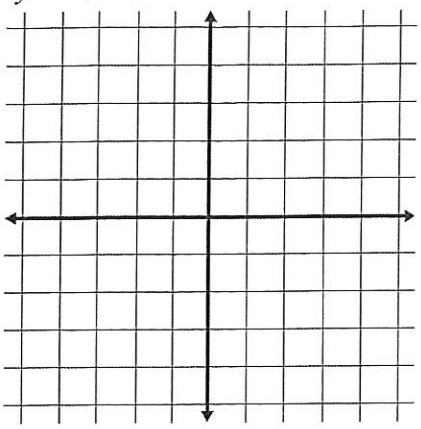
$x \to \infty \quad y \to \infty$

6) Find any asymptotes

None

Graph each function

$y = \sqrt{x+2}$



2) Find any intervals of increase or decrease

3) Is the function even odd or neither

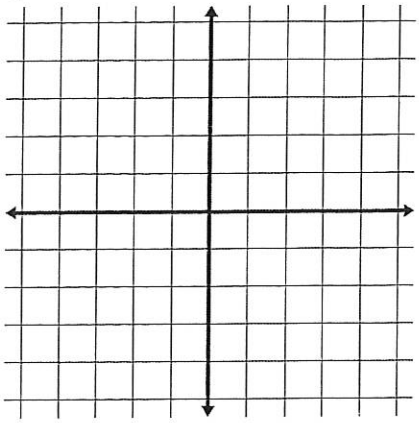
4) Find any extrema.

5) Describe the transformation from the base function

6) Determine the domain and range

7) Determine the end behavior

y = 2cosx + 1



2) Find any intervals of increase or decrease

3) Is the function even odd or neither

4) Find any extrema.

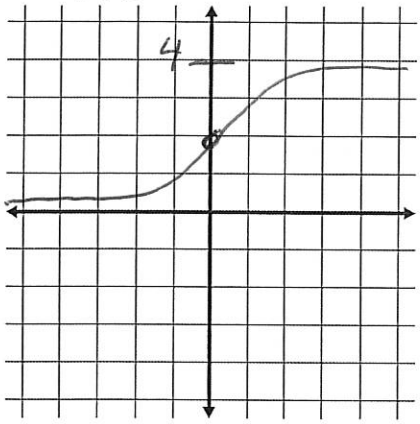
5) Describe the transformation from the base function

6) Determine the domain and range

7) Determine the end behavior

Graph each function

$y = \dfrac{4}{1 + e^{-x}}$



2) Find any intervals of increase or decrease

Inc $(-\infty, \infty)$

3) Is the function even odd or neither

neither

4) Find any extrema.

none

5) Describe the transformation from the base function

Stretched between 0 and 4 instead of 0 and 1

6) Determine the domain and range

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

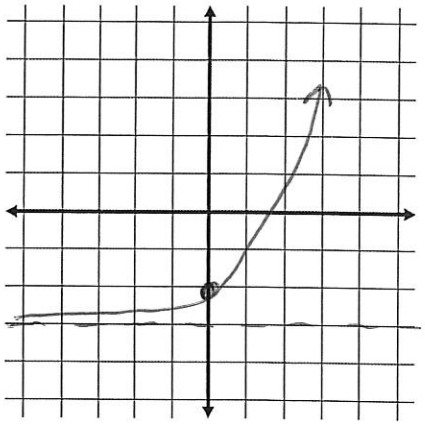
R: $(0, 4)$

7) Determine the end behavior

$x \to -\infty \quad y \to 0$

$x \to \infty \quad y \to 4$

$\mathbf{y = e^x - 3}$



2) Find any intervals of increase or decrease

$(-\infty, \infty)$ Inc

3) Is the function even odd or neither

neither

4) Find any extrema.

none

5) Describe the transformation from the base function

Down 3

6) Determine the domain and range

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

R: $(3, \infty)$

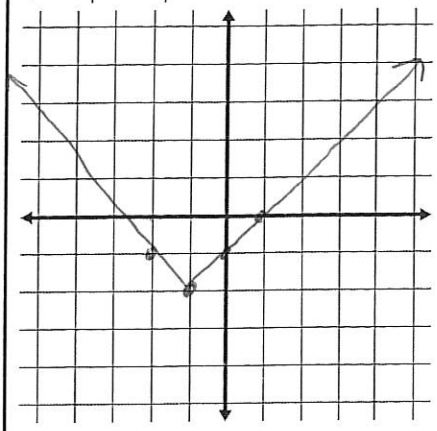
7) Determine the end behavior

$x \to -\infty \quad y \to -3$ (HA)

$x \to \infty \quad y \to \infty$

Graph each function

$y = |x+1| - 2$



2) Find any intervals of increase or decrease

Inc $(-1, \infty)$

Dec $(-\infty, -1)$

3) Is the function even odd or neither

neither

4) Find any extrema.

Abs min $(-1, -2)$

5) Describe the transformation from the base function

Left 1

Down 2

6) Determine the domain and range

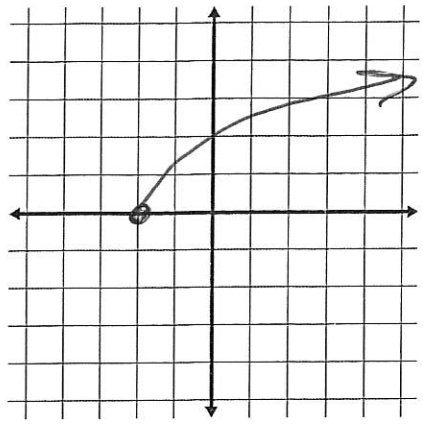
D: $(-\infty, \infty)$

R: $[-2, \infty)$

7) Determine the end behavior

$x \to \pm\infty \quad y \to \infty$

$y = \sqrt{x+2}$



2) Find any intervals of increase or decrease

Inc $(-2, \infty)$

3) Is the function even odd or neither

Neither

4) Find any extrema.

Min $(-2, 0)$

5) Describe the transformation from the base function

Left 2

6) Determine the domain and range

D: $[-2, \infty)$

R: $[0, \infty)$

7) Determine the end behavior

$x \to 2^- \quad y \to 0$

$x \to \infty \quad y \to \infty$