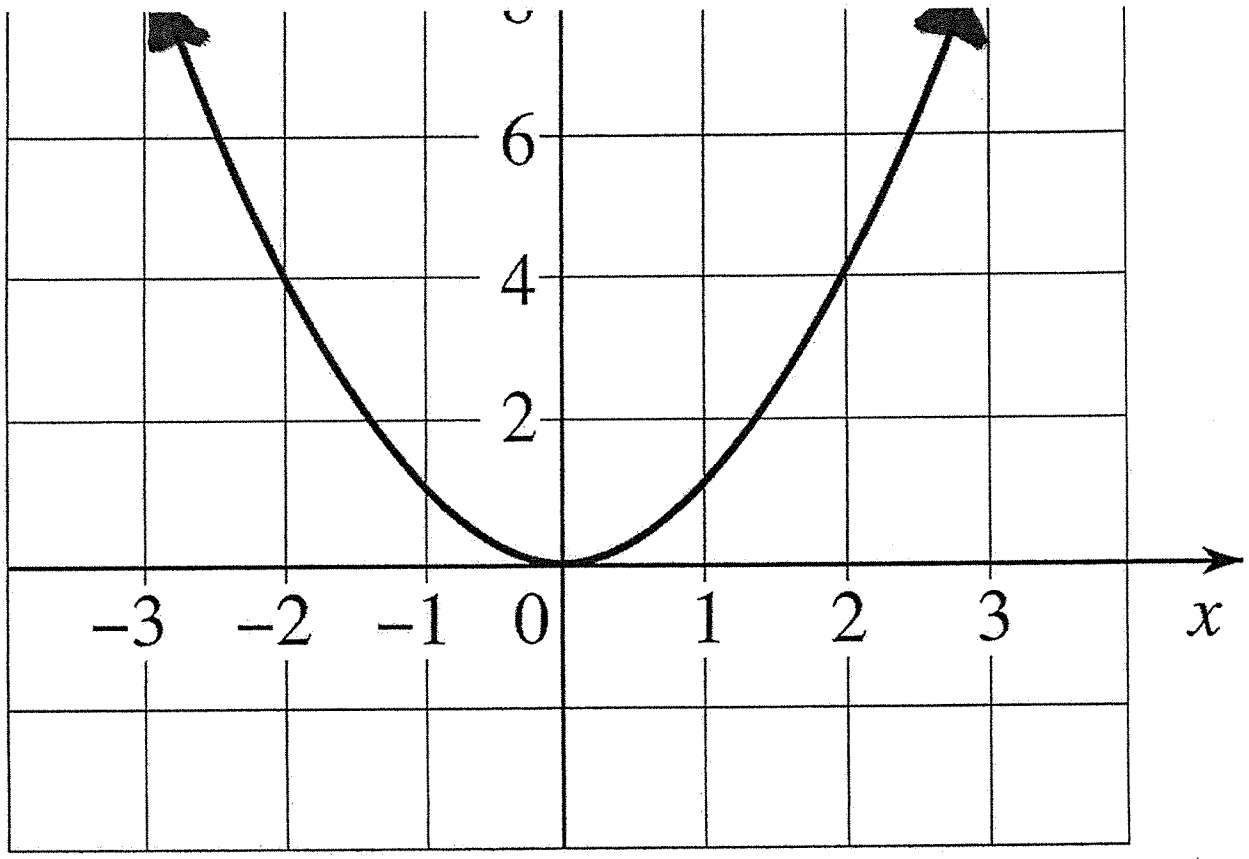
Problem #1



Function Family Name:

Domain:

Range:

Decreasing:

Increasing:

X-Intercept

Y-Intercept

Left End Behavior:

Right End Behavior:

Problem # 2

Sketch a graph of the following functions and identify the domain and range of each.

A) radical odd

sketch a graph

write the equation

domain = ?

range = ?

B) radical even

sketch a graph

write the equation

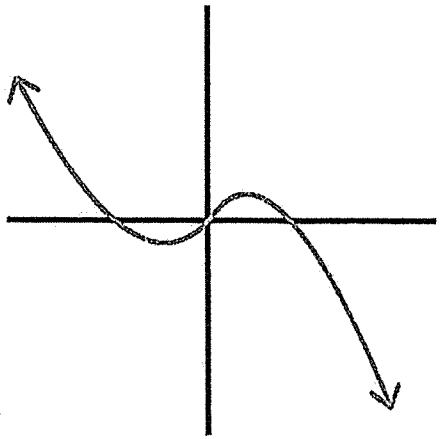
domain = ?

range = ?

Problem # 3

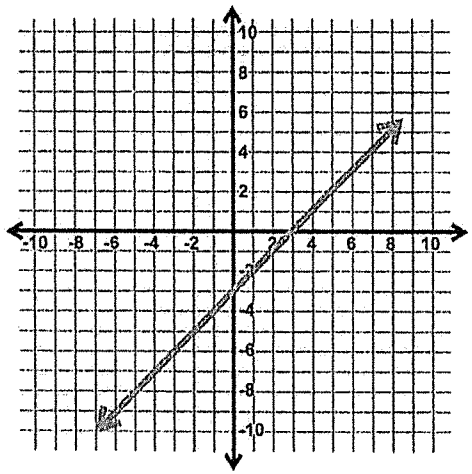
There are THREE different examples of end behaviors below. Sketch each graph on your answer document and state the LEFT and RIGHT end behaviors.

A)



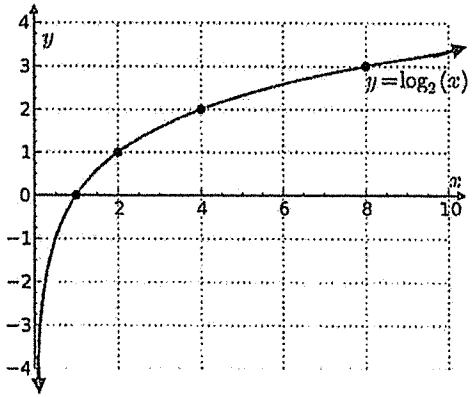
L: As x approaches _____, y approaches _____
R: As x approaches _____, y approaches _____

B)



L: As x approaches _____, y approaches _____
R: As x approaches _____, y approaches _____

C)



L: As x approaches _____, y approaches _____
R: As x approaches _____, y approaches _____

Problem # 4

Working with ONE OTHER PARTNER, create a large poster that satisfies the following conditions:

Sketch as many parent fcns that satisfy the following conditions:

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

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

As $x \to -\infty$, $y \to -\infty$

LEFT END BEHAVIOR: As x approaches $-\infty$, y approaches ~~$+\infty$~~ $-\infty$.

RIGHT END BEHAVIOR: As x approaches $+\infty$, y approaches $+\infty$.

As $x \to \infty$, $y \to \infty$

Problem # 5

Look at each equation below and write the name of the parent function.

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

B) $f(x) = |x + 1|$ _____

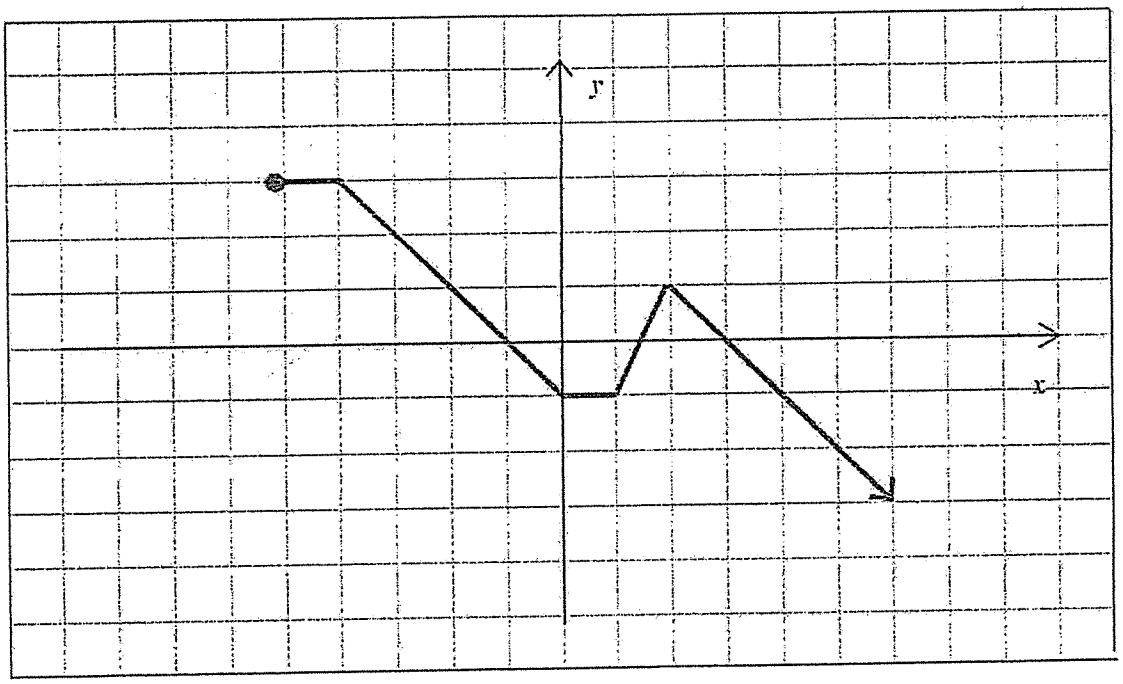
C) $f(x) = 4x^2 + 5x - 8$ _____

D) $f(x) = (\frac{1}{3})^x$ _____

E) $f(x) = 4x - \pi$ _____

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

Problem # 6



DOMAIN:

RANGE:

INCREASING:

DECREASING:

DECREASING:

CONSTANT:

CONSTANT:

Problem #7

Working with ONE OTHER PARTNER, create a large poster that satisfies the following conditions:

Sketch a fcn satisfying:

DOMAIN: $[0, \infty)$

RANGE: $[0, \infty)$

INCREASING: $(0, \infty)$

DECREASING: NONE

ASYMPTOTE: NONE

LEFT END BEHAVIOR: As x approaches 0, y approaches 0.

RIGHT END BEHAVIOR: As x approaches $+\infty$, y approaches $+\infty$.

Problem # 8

Sketch a graph of the following functions and identify the domain and range of each.

A) **polynomial odd**

sketch a graph

write the equation

domain = ?

range = ?

B) **polynomial even**

sketch a graph

write the equation

domain = ?

range = ?

PROBLEM 9- ALL ABOUT ASYMPTOTES

A) How are asymptotes shown on a graph? Why?

B) Which families have them?

C) Which families have horizontal ones? What is the eqn?

D) Which families have vertical ones? What is the eqn?

E) Which families have both an HA & VA?

PROBLEM 10 – END BEHAVIOR

A) What format do we use for end behavior?

B) What are the 3 possible answers that can go in the blank for y → __?__

C) Which family has no end behavior?

D) Which family or families have end behavior that <u>does not</u> involve $\pm\infty$ for the last blank?

Problem 11 – Domain and Range

A) What are the 2 questions you ask yourself about a graph to figure out the domain? The range?

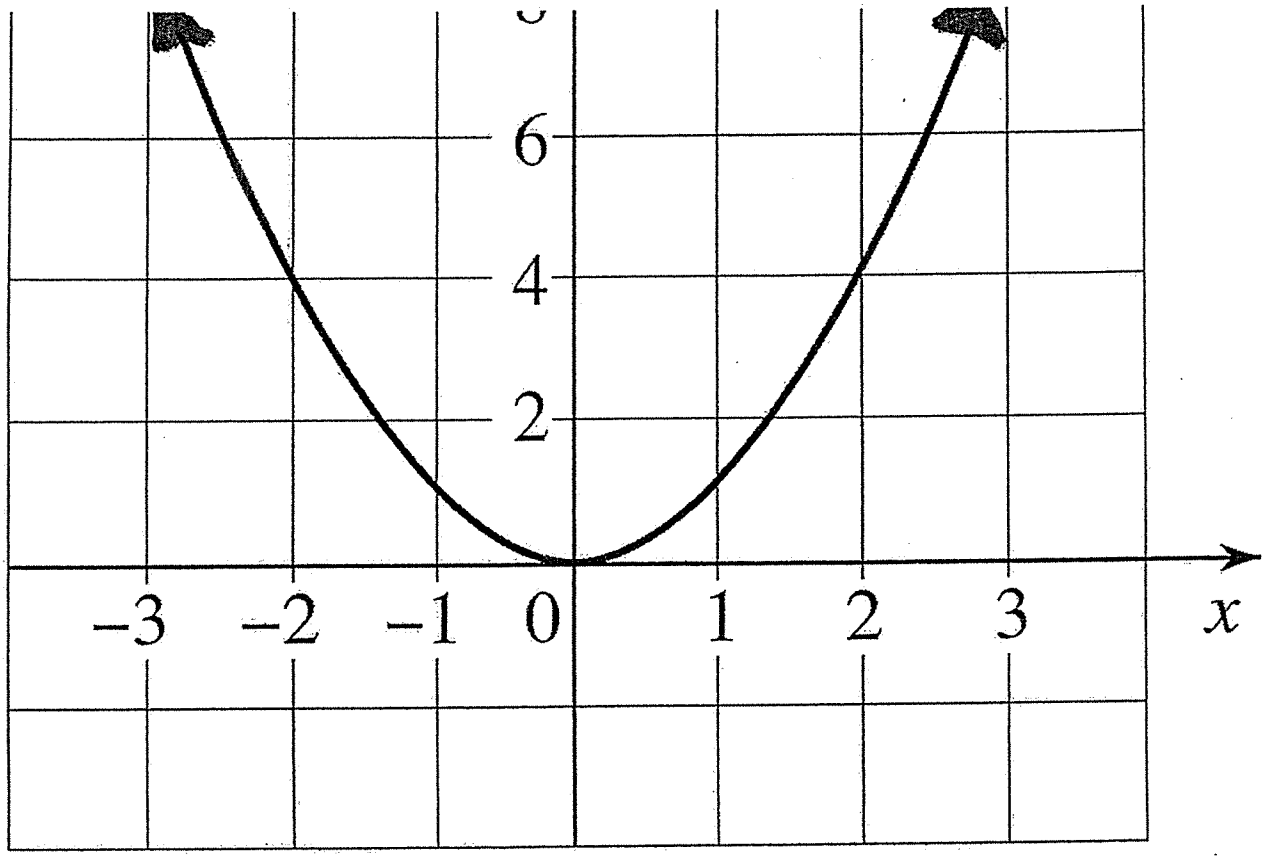
B) If the answer is yes to both, what is the domain? Range?

C) Which families have an unrestricted domain?

D) Which families have an unrestricted range?

E) Which families have both? Is there a pattern?

Problem #1



Function Family Name: Polynomial (even)

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

Range: $[0, \infty)$ (bracket on left)

Decreasing: $(-\infty, 0)$

Increasing: $(0, \infty)$

X-Intercept $(0, 0)$

Y-Intercept $(0, 0)$

Left End Behavior: As $x \to \infty$, $y \to \infty$

Right End Behavior: As $x \to -\infty$, $y \to \infty$

Problem # 2

Sketch a graph of the following functions and identify the domain and range of each.

A) radical odd

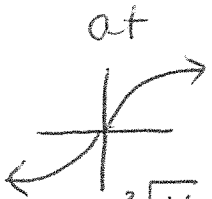
sketch a graph

write the equation

domain = ?

range = ?

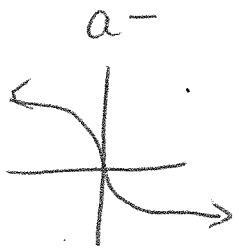
Ans vary



$y = 2\sqrt[3]{x}$

D $(-\infty, \infty)$

R $(-\infty, \infty)$



$y = -5\sqrt[7]{x}$

B) radical even

sketch a graph

write the equation

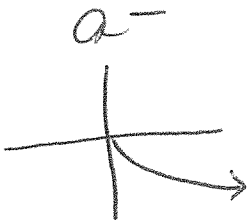
domain = ?

range = ?

$y = 6\sqrt{x}$

$[0, \infty)$

$[0, \infty)$



$y = -\sqrt[6]{x}$

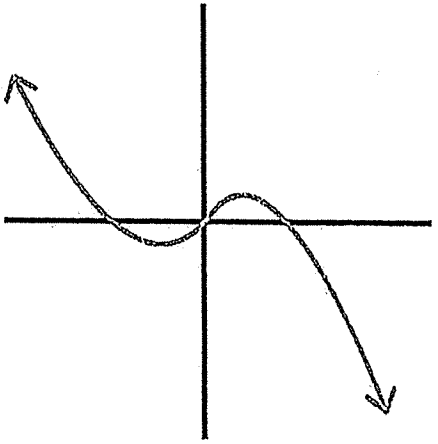
D $[0, \infty)$

R $(-\infty, 0]$

Problem # 3

There are THREE different examples of end behaviors below. Sketch each graph on your answer document and state the LEFT and RIGHT end behaviors.

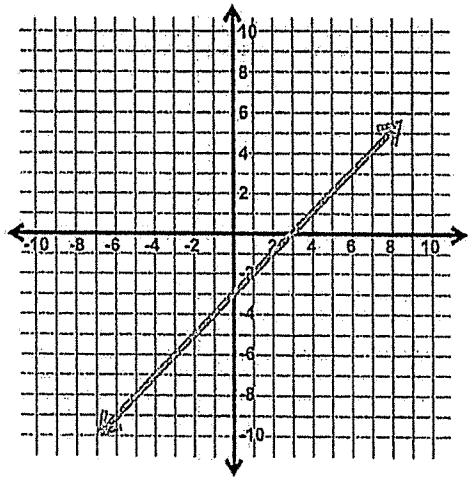
A)



L: As x approaches $-\infty$, y approaches ∞

R: As x approaches ∞, y approaches $-\infty$

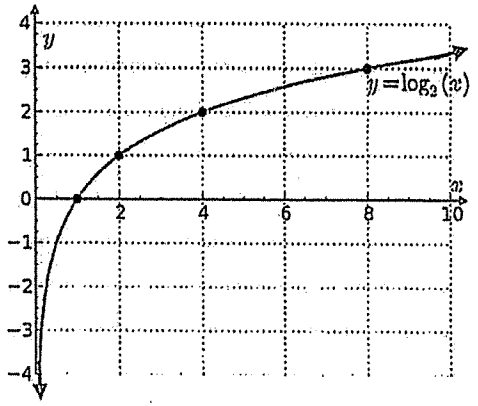
B)



L: As x approaches $-\infty$, y approaches $-\infty$

R: As x approaches ∞, y approaches ∞

C)



L: As x approaches 0, y approaches $-\infty$

R: As x approaches ∞, y approaches ∞

Problem # 4

Working with ONE OTHER PARTNER, create a large poster that satisfies the following conditions:

Sketch as many parent fcns that satisfy the following conditions:

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

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

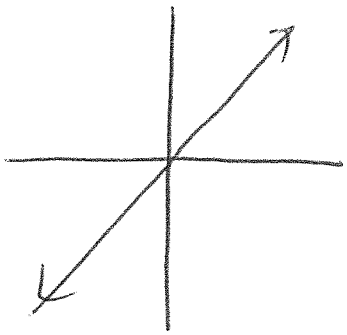
As $x \to -\infty$, $y \to -\infty$

LEFT END BEHAVIOR: As x approaches $-\infty$, y approaches $-\infty$.

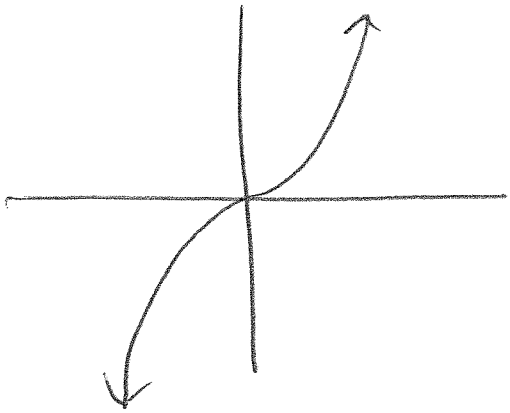
RIGHT END BEHAVIOR: As x approaches $+\infty$, y approaches $+\infty$.

As $x \to \infty$, $y \to \infty$

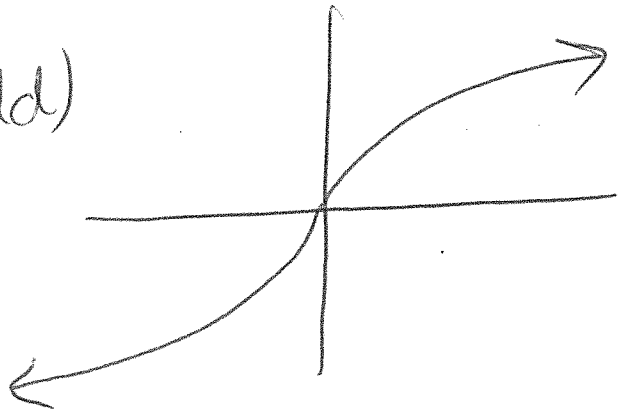
Linear



Polynomial (odd)



Radical (odd)



Problem # 5

Look at each equation below and write the name of the parent function.

A) $f(x) = \sqrt[3]{x} - 3$ Radical (odd)

B) $f(x) = |x + 1|$ Absolute Value

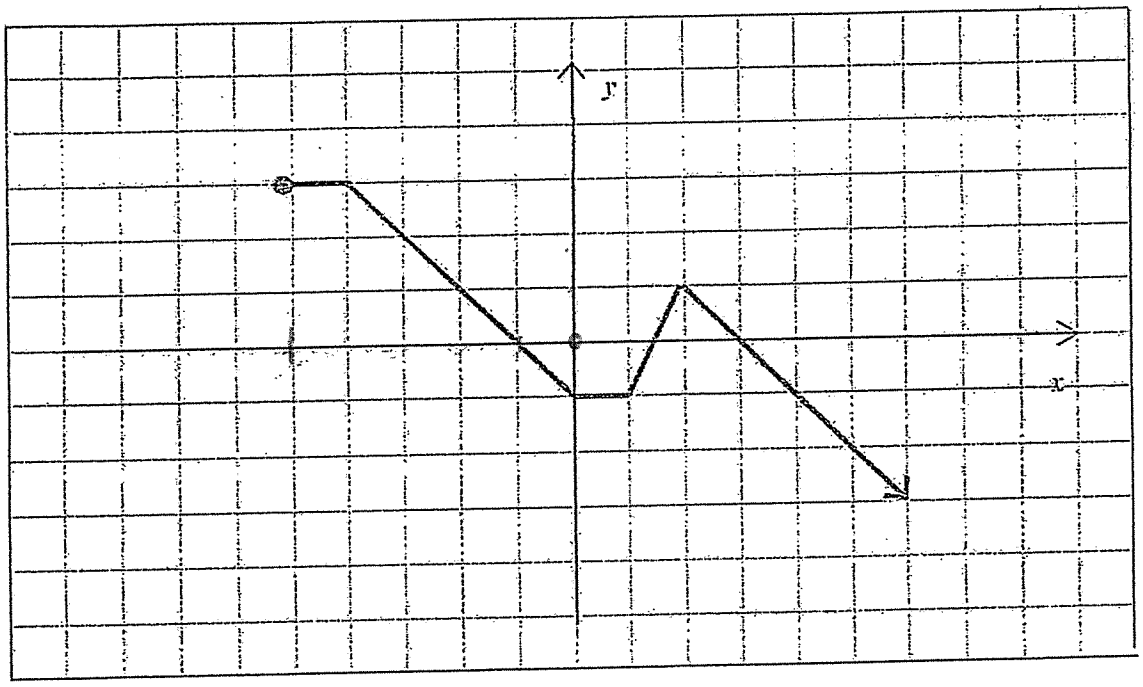
C) $f(x) = 4x^2 + 5x - 8$ Polynomial (even)

D) $f(x) = (\frac{1}{3})^x$ Exponential (decay)

E) $f(x) = 4x - \pi$ Linear

F) $f(x) = x^3$ Polynomial (odd)

Problem #6



DOMAIN: $[5, \infty)$

RANGE: $(-\infty, 3]$

INCREASING: $(1, 2)$

DECREASING: $(-4, 0) \cup (2, \infty)$

~~DECREASING:~~

CONSTANT: $(-5, -4) \cup (0, 1)$

~~CONSTANT:~~

Problem #7

Working with ONE OTHER PARTNER, create a large poster that satisfies the following conditions:

Sketch a fcn satisfying:

DOMAIN: $[0, \infty)$

RANGE: $[0, \infty)$

INCREASING: $(0, \infty)$

DECREASING: NONE

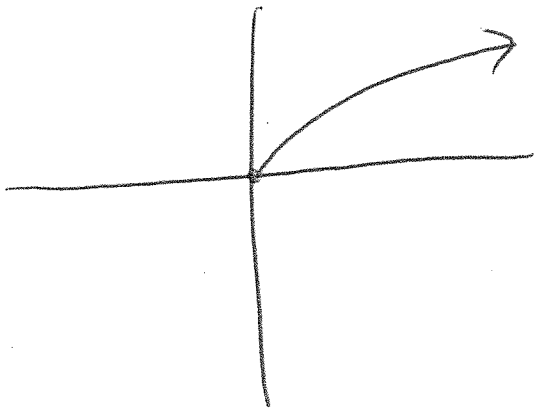
ASYMPTOTE: NONE

LEFT END BEHAVIOR: As x approaches 0, y approaches 0.

RIGHT END BEHAVIOR: As x approaches $+\infty$, y approaches $+\infty$.

Radical (even)

a must be +



Problem # 8

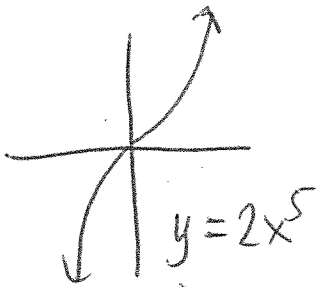
Sketch a graph of the following functions and identify the domain and range of each.

A) polynomial odd

- sketch a graph
- ★ write the equation
- domain = ?
- range = ?

Ans vary

a+

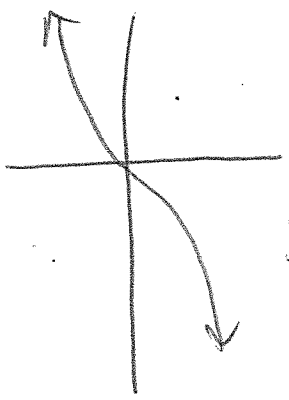


$y = 2x^5$

$D(-\infty, \infty)$

$R(-\infty, \infty)$

a−



$y = -6x^7$

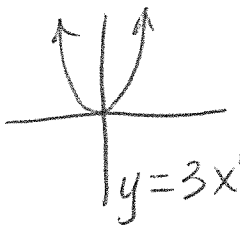
$D(-\infty, \infty)$

$R(-\infty, \infty)$

B) polynomial even

- sketch a graph
- ★ write the equation
- domain = ?
- range = ?

a+

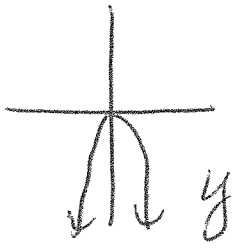


$y = 3x^4$

$D(-\infty, \infty)$

$R[0, \infty)$

a−



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

$D(-\infty, \infty)$

$R(-\infty, 0]$

PROBLEM 9- ALL ABOUT ASYMPTOTES

A) How are asymptotes shown on a graph? Why?

As dashed lines; they are not part of/on the graph. They appear on x or y values that the equation can never equal.

B) Which families have them?

Exponential, Rational, Logarithm + Trigonometric (tan only)

C) Which families have horizontal ones? What is the eqn?

HA: Exponential + Rational For parent fcns: $y = 0$

D) Which families have vertical ones? What is the eqn?

VA: Logarithm, Rational, Trigonometric (tan only) $x = 0$ → $x = \frac{\pi}{2} + n\pi$

E) Which families have both an HA & VA?

Rational has both

PROBLEM 10 – END BEHAVIOR

A) What format do we use for end behavior?

R: As $x \to \infty$, $y \to$?

L: As $x \to -\infty$*, $y \to$?

*Some fans don't go to $-\infty$

B) What are the 3 possible answers that can go in the blank for y → __?__

∞

$-\infty$

0 (for now) (k=0)

C) Which family has no end behavior?

Trigonometric

D) Which family or families have end behavior that <u>does not</u> involve $\pm\infty$ for the last blank?

Radical, Rational, Exponential

Problem 11 – Domain and Range

A) What are the 2 questions you ask yourself about a graph to figure out the domain? The range?

Does the graph go forever L+R Domain? U+D Range?
Can you draw the graph w/out picking up your pencil

B) If the answer is yes to both, what is the domain? Range?

$(-\infty, \infty)$ for both

C) Which families have an unrestricted domain?

Linear, Absolute Value, Polynomial (odd + even), Radical (odd)
Exponential (growth + decay) Trigonometric (sin + cos only)

D) Which families have an unrestricted range?

Linear, Polynomial (odd), Radical (odd), Trigonometric (tan only)

E) Which families have both? Is there a pattern?

Linear
Polynomial (odd)
Radical (odd)
} all have x^{odd} in their equation, where x is in the numerator