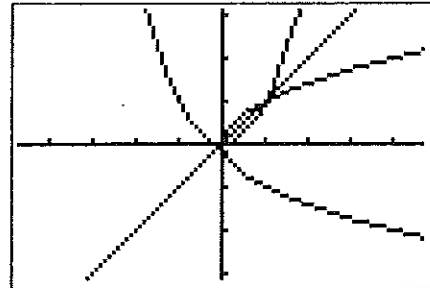
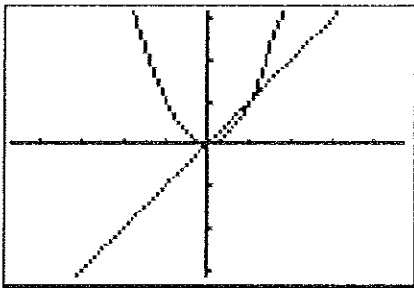


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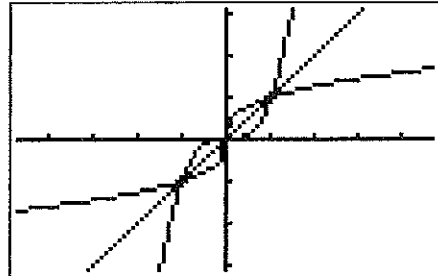
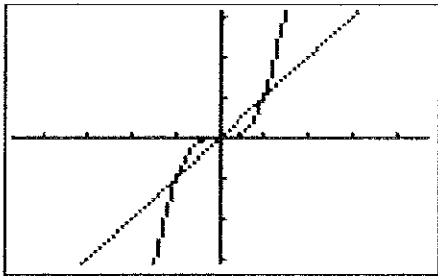
Section 3-4 Notes: Inverse Functions

- Inverses are opposites (Like addition to subtraction and multiplication to division)
- Inverses are symmetric about the line  $y=x$
- The horizontal line test will tell if the inverse of a graph will be a function.
- Notation: if  $f(x)$  is the original, then the inverse will be  $f^{-1}(x)$

Example 1:



Example 2:



Finding Inverses:

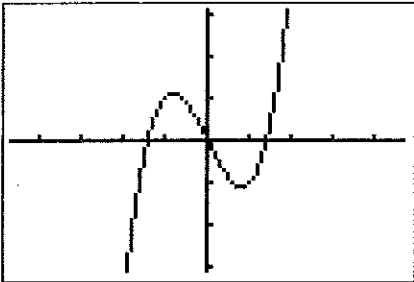
- Switch the  $x$  and  $y$  variables
- Solve for  $y$
- Example – find the inverse of  $y = 2x - 5$

Example 7 & 8 on Homework sheet

Find the inverse of  $y = \frac{1}{2}x - 2$

Find the inverse of  $y = 1/(x + 1)$

Is the inverse of this graph a function?



Find the inverse of  $y = (1/x)^2$

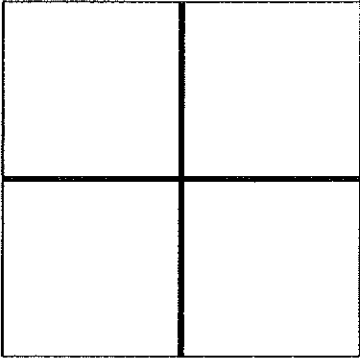
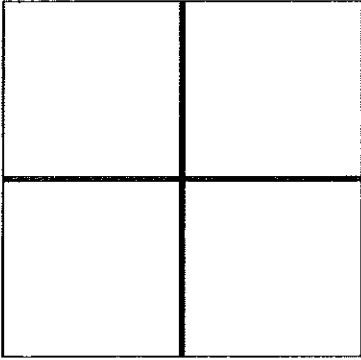
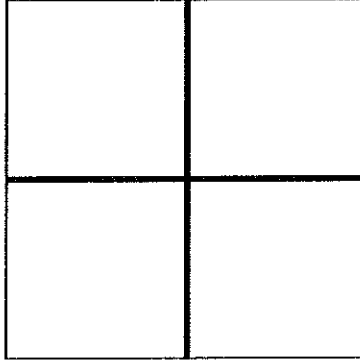
Assignment: Worksheet 3-4A

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Section 3-5 Notes: Continuity & End Behavior

Day 1 - Continuity:

- A function is continuous if it can be drawn without picking up the pencil.
- A function is continuous at a point if the pencil does not need to be picked up at that point while graphing.

Jump $F(x) = 2 \quad x < 0$ $-2 \quad x > 0$	Infinite $F(x) = \frac{1}{x^2}$	Point $F(x) = \frac{x^2-1}{x+1}$
		

How do you tell if it is a hole or an asymptote?

- If the x value that creates 0 in the denominator can be eliminated through factoring and division, then a hole will be at the x value.
- If it cannot be eliminated, it is an asymptote.

Example:

is  $f(x) = 1/x$  continuous at  $x=0$ ?

Homework: Worksheet 1-Continuity

Day 2 – End Behavior:

- The answer to an end behavior question is a y value as x approaches infinity or negative infinity.
- Notation: as  $x \rightarrow$  ,  $y \rightarrow$  and as  $x \rightarrow -$  ,  $y \rightarrow -$
- Three possibilities:
  - Negative infinity
  - Infinity
  - A number that it approaches but never reaches (horizontal asymptote)

Method 1: Family of Functions

Picture the parent functions end behavior.

Examples

$$f(x) = x^2 - x + 4$$

20.  $y = x^3 + 2x^2 + x - 1$

Method 2: Calculator Method

Set the window so x-min = -100 and x-max = 100, then trace to the far left/right looking at the y values.

Examples

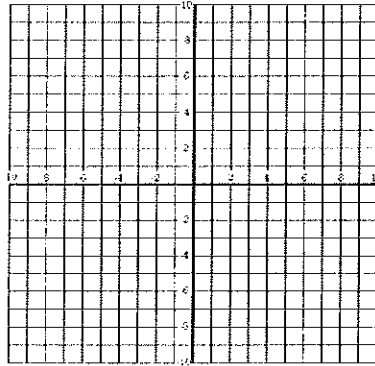
22.  $f(x) = x^{10} - x^9 + 5x^8$

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Section 3-5 Notes: Increasing & Decreasing Intervals

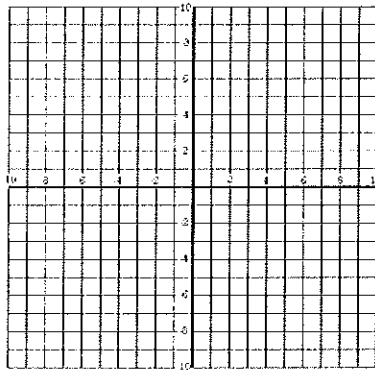
Critical Points:

- Points where the graph changes from increasing to decreasing.
- Usually at a min or max
- Picture:



Intervals of Increasing or Decreasing:

- Your answers to an increasing/decreasing question are the x values in bracket notation.
- Picture:



Example: #26  $y = x^3 + 3x^2 - 9x$

Example: #28  $f(x) = 1/(x + 1) - 4$

Your Turn: #27  $y = -x^3 - 2x + 1$

