

Pre-Calculus Chapter 2 Piecewise Functions & Systems of Equations

Section 1.7 Piecewise Functions Day 1

What is a Piecewise Function?

- One graph that is created with pieces of other graphs.
- Examples:

How do we graph a Piecewise Function?

- Lightly sketch all graphs
- Accurately place points at the cut-off values (look at the inequalities)
- Darken and Erase appropriately
- With the equal sign (\leq or \geq) is a closed circle
- Without the equal sign ($<$ or $>$) is an open circle

Example from Piecewise Worksheet 1: #1 & 4

Your Turn from Piecewise Worksheet 1: #2

Working Backwards: sketch the graphs used to create the functions:

$y = x$

$y = -x$

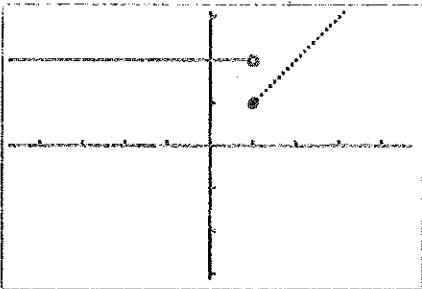
$y = x^2$

$y = -x^2$

$y = 2$

$y = 1$

Example:



Your Turn from Piecewise Worksheet 1: middle piecewise function.

Assignment: Finish 2-1A

Section 1.7 More Practice Day 2

Game

Assignment: Worksheet 1-7B

Section 1.7 Piecewise Functions on a Calculator Day 3

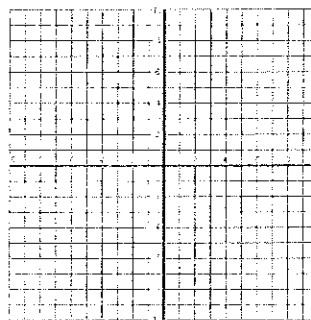
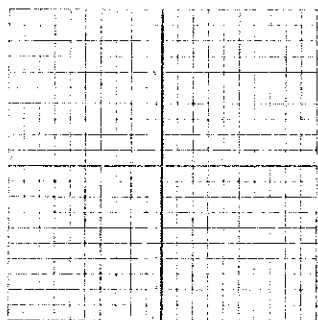
How to Put the Functions into the Calculator

- Put Everything in parenthesis!!
- The inequalities are in the TEST menu which is 2nd MATH
- $7x-1 < 1$ is entered $(7x-1)(x<1)$
- $3x+2 > -1$ is entered $(3x+2)(-1<x)(x<2)$

Examples:

$$y = \begin{cases} x & x < -2 \\ 2 & -2 \leq x \leq 3 \\ -x & x > 3 \end{cases}$$

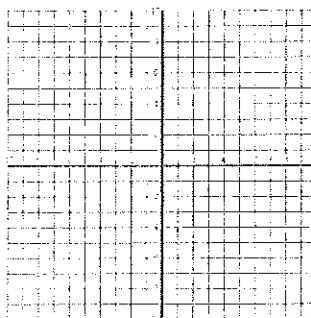
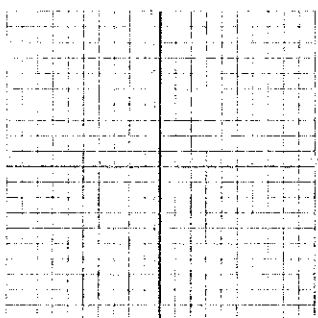
$$y = \begin{cases} x^2 & x < 0 \\ -x & x \geq 0 \end{cases}$$



Your Turn:

$$y = \begin{cases} x^2 & x < -2 \\ x & -2 \leq x \leq 1 \\ -1 & x > 1 \end{cases}$$

$$y = \begin{cases} x^2 & x < -3 \\ x & -3 \leq x < 1 \\ -x^3 & x \geq 1 \end{cases}$$



Assignment: Finish Worksheet 2-2B

Section 2-1 2x2 Systems of Equations Day 1

Solving a System of Equations:

- The goal is to find the ordered pair where the two lines cross.
- Types of Solutions:
 - One intersection point (x, y)
 - Not all lines cross (parallel: no solution)
 - Some lines are the same (coinciding: infinite solutions)

Substitution

- Solve for 1 variable
- Plug into the other equation
- Solve for the remaining variable
- Plug into an original equation to find the second variable

Example from Worksheet 2-1A: 21

Your Turn from Worksheet 2-1A: 5 & 6

Elimination

- Line up the x, y, = and #
- Multiply to get #'s to cancel
- Add
- Solve
- Plug into an original to find the second variable

Example from Worksheet 2-1A: 7

Example from Worksheet 2-1A: 8

Infinite and Non-existent Solutions

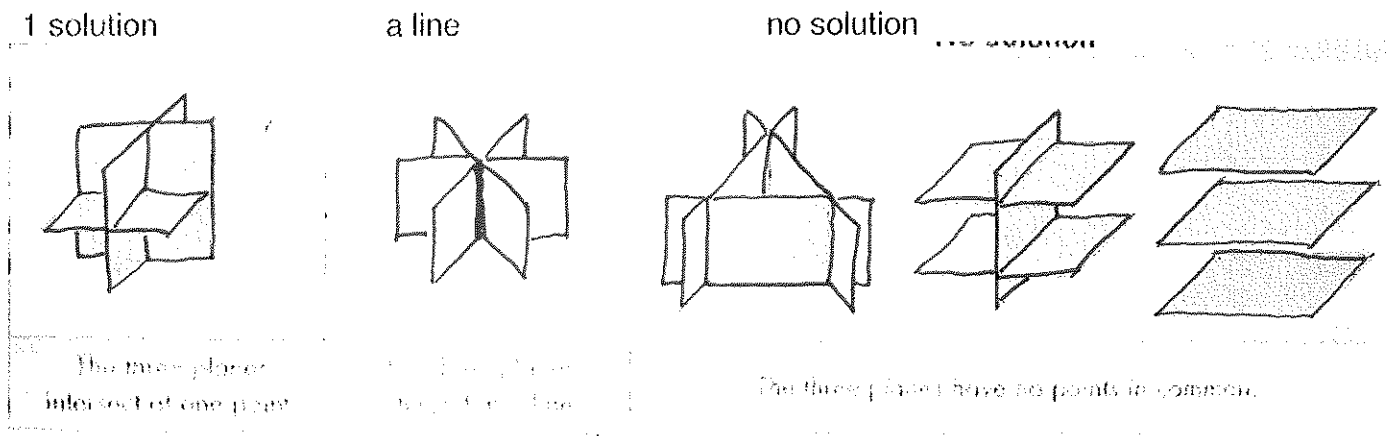
- If both variables disappear, then you will either have a true statement or a false statement
- True Statement means "infinite solution" and can be written as the equation of a line.
 - Example $Y = 2x + 1$ $2y - 4x = 2$
 $2(2x+1) - 4x = 2$
 $4x + 2 - 4x = 2$
 $2 = 2$ is true, infinite solutions
- False statement means "no solution"
 - Example $Y = 2x + 1$ $2y - 4x = 7$
 $2(2x+1) - 4x = 7$
 $4x + 2 - 4x = 7$
 $2 = 7$ is false, no solution

Assignment: finish worksheet 2-1A

Section 2-2 3x3 Systems of Equations Day 1

Solutions in a System with 3 Equations:

- An equation with x , y , and z represents a plane in 3-dimensions.
- Not all 3x3 equations have solutions - Look at the possible ways to cross on page 73:



How to solve a system with 3 equations:

- Find an equation where it is easy to solve for 1 variable and solve.
- Plug this equation into the other 2 equations and simplify.
- Now you have 2 equations with 2 variables. Use substitution or elimination.
- Go back to the equation in step 1 and find the third variable
- List the answer as an ordered triple (x, y, z)

Discuss infinite and no solution examples

Example from 2-2A: 4, 5

Your Turn from 2-2A: 8, 9

Assignment: finish worksheet 2-2A

Section 2-2 3x3 Systems of Equations using technology Day 2

Solutions in a System with 3 Equations:

Entering the problem

- 2nd Matrix
- Right arrow to edit and press enter
- Enter 3x4 as the dimensions and place the coefficients into the matrix.

Solving

- Return to the Home screen (2nd Quit)
- Press 2nd Matrix
- Right arrow to math, select rref(
- Press 2nd Matrix and enter twice.

Reading the solution:

If the matrix has a solution, it will be in the following pattern:

If it is not in this pattern, there is no solution that can be found using this method.

Example from 2-2B: 6, 12

Your Turn from 2-2B: 13, 14

Assignment: finish worksheet 2-2B

