

Algebra II Pre-AP/GT
Unit 2 - Relations and Functions
September 11 to September 26

Date	Topic	Assignment
Thur 9/11	2.1 Introduction to Functions and Function Notation	In-class handout and activity
Fri 9/12	2.2 Slope and Rate of Change Finding Intercepts	Pg. 86 (2-22even, 36-42even, and finding intercepts worksheet)
Mon 9/15	2.3 Graphing Lines	Pg. 93 (14, 16, 18, 22-54 even, 63, 64)
Tues 9/16	2.4 Writing Equations of Lines	Pg. 101 (4-36 even, 46)
Wed 9/17	2.6 Linear Regression	Pg. 117 (3-5, 7-9, 16-18, and worksheet)
Thur 9/18	Transformations	Worksheet
Fri 9/19	2.7 Graphing Absolute Value	Pg. 127 (3-5, 8, 11-20, 29-31)
Mon 9/22	Graphing Piecewise Functions and Absolute Value Functions	Worksheet
Tues 9/23	More on Piecewise Functions	Worksheet
Wed 9/24	Review for Test	Study!!
Thur 9/25	Test 2	
Fri 9/26	County Fair Day	

Friday, September 12**Finding Intercepts**

Find the x and y-intercepts for the following.

- 1) $5x + 10y = 20$ 2) $5y + 12 = 3x$ 3) $2x + 3y = 12$ 4) $5y - 4 = 2x$ 5) $12x - 8y = 32$
 6) $y = |x + 4| - 5$ 7) $y = -|x + 3| + 5$ 8) $y = 5|2x - 3| - 10$ 9) $y = |3x - 2| - 4$ 10) $y = |2x - 3|$

Wednesday, September 17**Linear Regression Problems**

1. AGE and SYSTOLIC BLOOD PRESSURE: The table below shows the age and systolic blood pressure for a group of people who recently donated blood.

Age	35	24	48	50	34	55	30	26	41	37
Blood Pressure	128	108	140	135	119	146	132	104	132	121

- Find the regression line for this data.
- Based on the regression equation, predict the blood pressure of a 15 year old; of a 60 year old:
- What did the data list as the blood pressure of a 50 year old?
- Predict the age of a person with a blood pressure of 130.

2. WHEAT and PRICE PROBLEM The table below shows the price per bushel and how many thousand bushels of wheat were sold at that price during a 10-day selling period in Iowa.

Price (\$/bushel)	3.84	3.66	3.87	3.96	3.60	4.05	3.63	3.60	3.72	3.87
Bushels sold (thousands)	50	47	38	28	49	23	47	46	39	42

- What is the independent variable? the dependent variable?
- Find a regression equation for the data.
- If the market price of wheat is \$3.90/bushel, how many bushels of wheat can you predict will be sold?
- Estimate the price of wheat when 25,000 bushels were sold.

September 13 (continued)

3. AGE vs. NUMBER OF CD'S PROBLEM: Sixteen people of various ages were polled and asked to estimate the number of CDs they had bought in the previous year. The following table contains the collected data.

Age	18	20	20	22	24	25	25	26	28	30	30	31	32	33	35	45
CDs	12	15	18	12	10	8	6	6	4	4	4	2	2	3	6	1

- What is the independent variable? the dependent variable?
- Find the linear regression equation for this data set.
- Predict the number of CDs purchased by a person who is 37 years old.
- Predict the age of a person who purchased 21 CDs in the previous year.

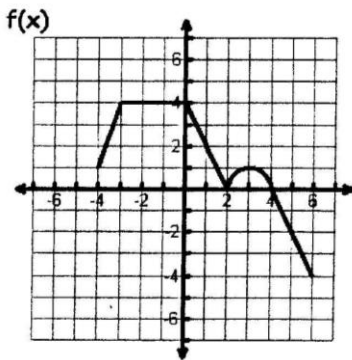
4. OLYMPIC 100 METER FREESTYLE PROBLEM

The table shows the winning times for the 100 meter freestyle at the Olympics since 1948. For your x-coordinates, use the years since 1948. (In other words, 1948 is year 0).

Year	1948	1952	1956	1960	1964	1968	1972	1976	1980	1984	1988	1992
Men Winning Time	57.3	57.4	55.4	55.2	53.4	52.2	51.2	50.0	50.4	49.8	48.6	49.0
Women's Winning Time	66.3	66.8	62.0	61.2	59.5	60.0	58.6	55.7	54.8	55.9	54.9	54.6

- Find a linear regression line for the men's data.
- Make a prediction for the men's time in 2050?
- Find a linear regression line for the women's data.
- Make a prediction for the women's time in 2050?
- The women's times are decreasing faster than the men's. Will the regression line give us a value when their times will be the same? What year would this be?

Sketch graphs of the following transformations of $f(x)$. Give the domain and range.



1) $f(x+3)-1$

2) $2f(x)+1$

3) $-f(x-4)$

4) $\frac{1}{2}f(x-5)+2$

5) $f(-x)-2$

6) $f(x+3)-1$

7) $-2f(x-1)+4$

8) $f(-x-1)$

9) $-f(x)+5$

I. Graph each piecewise function.

1) $f(x) = \begin{cases} 2x+1 & x \geq 3 \\ x+5 & x < 3 \end{cases}$

2) $f(x) = \begin{cases} -x+4 & x < 0 \\ \frac{1}{2}x+4 & x \geq 0 \end{cases}$

3) $f(x) = \begin{cases} \frac{2}{3}x-4 & x < -2 \\ 3 & x \geq -2 \end{cases}$

4) $y = \begin{cases} |x| & x \leq 1 \\ 2x-4 & x > 1 \end{cases}$

5) $f(x) = \begin{cases} 2x-3 & x < -1 \\ 3 & -1 \leq x < 3 \\ -x+6 & x \geq 3 \end{cases}$

6) $y = \begin{cases} -4 & x \leq -3 \\ |x|-2 & -3 < x < 2 \\ 5 & x \geq 2 \end{cases}$

II. State the transformations for each function. DO NOT GRAPH.

7) $y = -|x-5|+7$

8) $f(x) = \frac{1}{6}|x+7|-15$

9) $y = f(-x-6)+1$

III. For each absolute value function: state the domain, range, intercepts and graph.

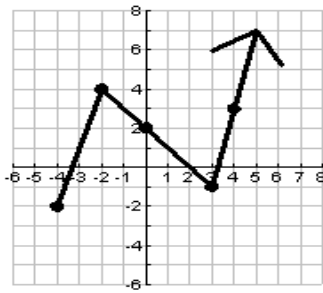
10) $y = -|x-2|+3$

11) $y = 2|x+4|-1$

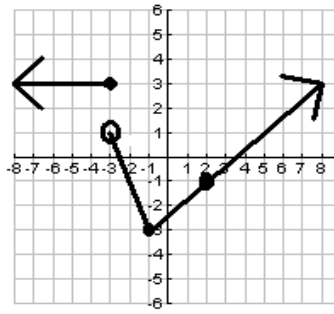
12) $f(x) = -\frac{1}{2}|x|-2$

I. Write a piecewise function for each graph shown and find the requested information.

1)



2)



II. Graph the given functions.

3)
$$f(x) = \begin{cases} 3-2x & x \leq 1 \\ 4 & 1 < x < 3 \\ \frac{2}{3}x-4 & x \geq 3 \end{cases}$$

4)
$$f(x) = \begin{cases} 2x-1 & x \leq -1 \\ x+2 & -1 < x \leq 1 \\ -2 & x \geq 3 \end{cases}$$

5)
$$f(x) = \begin{cases} |x| & x < 3 \\ -\frac{1}{3}x+4 & x \geq 3 \end{cases}$$

III. For each function find the requested information.

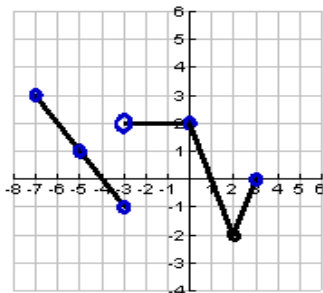
6)
$$f(x) = \begin{cases} \sqrt{x^2+9}, & \text{if } x < 0 \\ \frac{x-3}{x+5}, & \text{if } x \geq 0 \end{cases}$$

7)
$$f(x) = \begin{cases} 2+x, & \text{if } -3 \leq x < 0 \\ 3, & \text{if } x = 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$$

a) $f(-2)$ b) $f(0)$ c) $f(5)$

a) $f(0)$ b) $f(9)$ c) $f(-1)$

4. Use the graph of the function $g(x)$ to answer the following questions.



- Find $g(2)$ and $g(3)$
- Write the domain and range.
- How often does the line $y = -1$ intersect the function?
- For what values of x does $g(x) = 1$?
- For what values x does $g(x) = 2$?
- For what values of x is $g(x) > 0$?
- For what values of x is $g(x) = 0$?
- For what values of x is $g(x) < 0$?