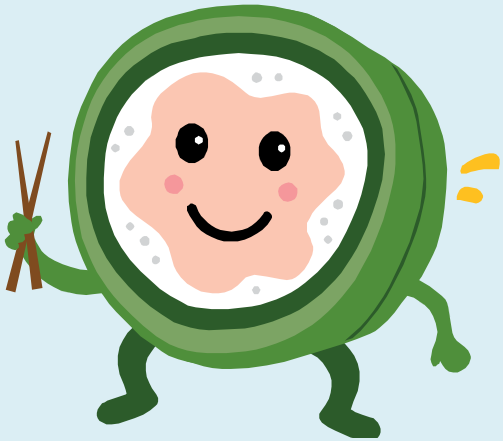
Unit 2 Day 10

FRED Functions – Part 2

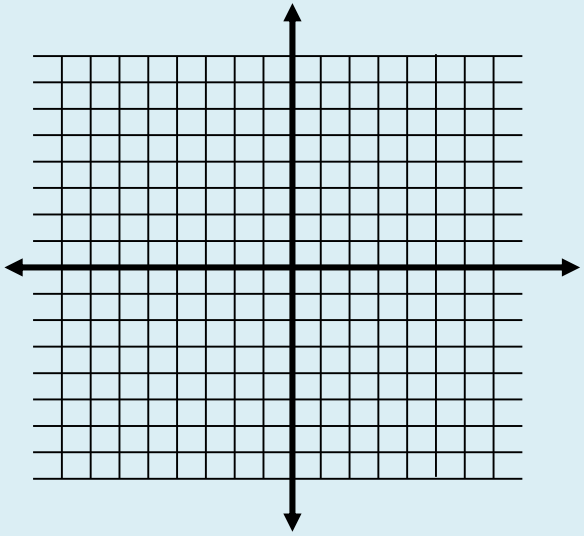


Warm Up

Graphing quadratic systems ->
Graph both quadratics, then darkly shade the area of overlap.

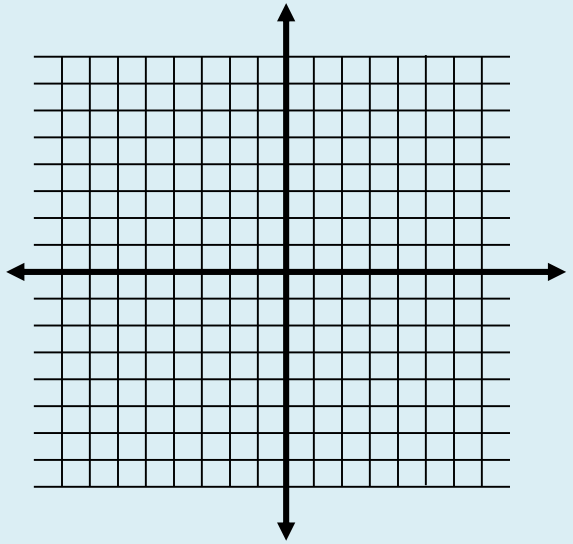
1) $y \leq -x^2 - x + 12$

$y \geq x^2 + 7x + 12$



2) $y < -x^2 + 4x - 3$

$y > x^2 + 6x + 8$



Factor completely

3) $81x^4 - 16$

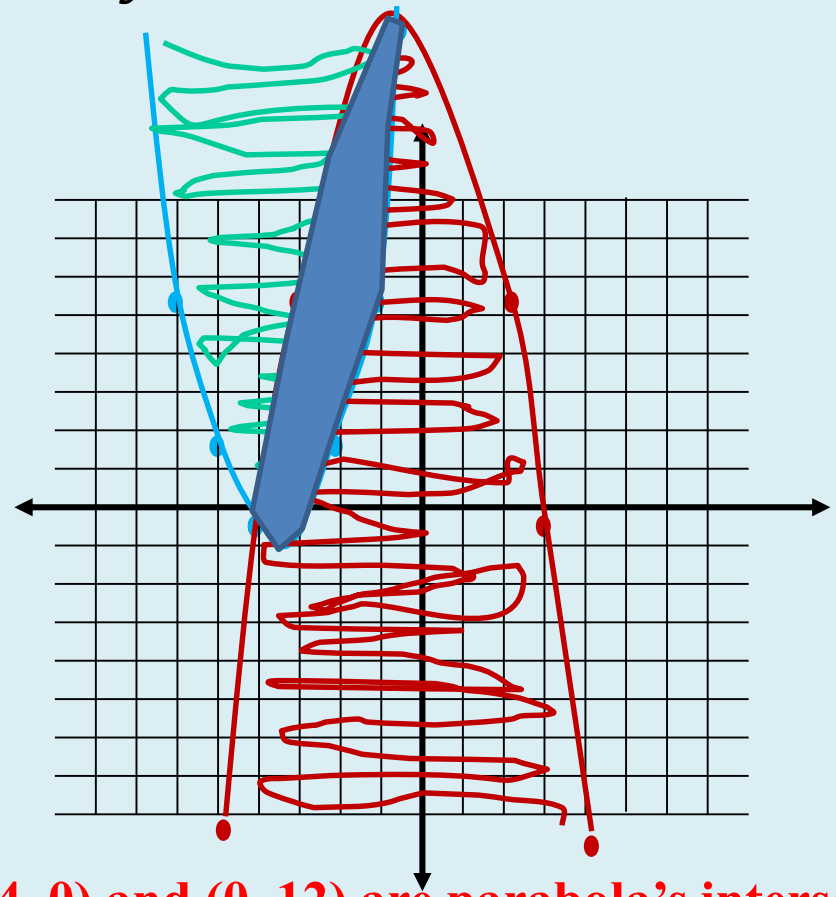
4) $12x^2 + 26x - 10$

Warm Up Answers

Graph both quadratics, then darkly shade the area of overlap.

1) $y \le -x^2 - x + 12$

$y \ge x^2 + 7x + 12$

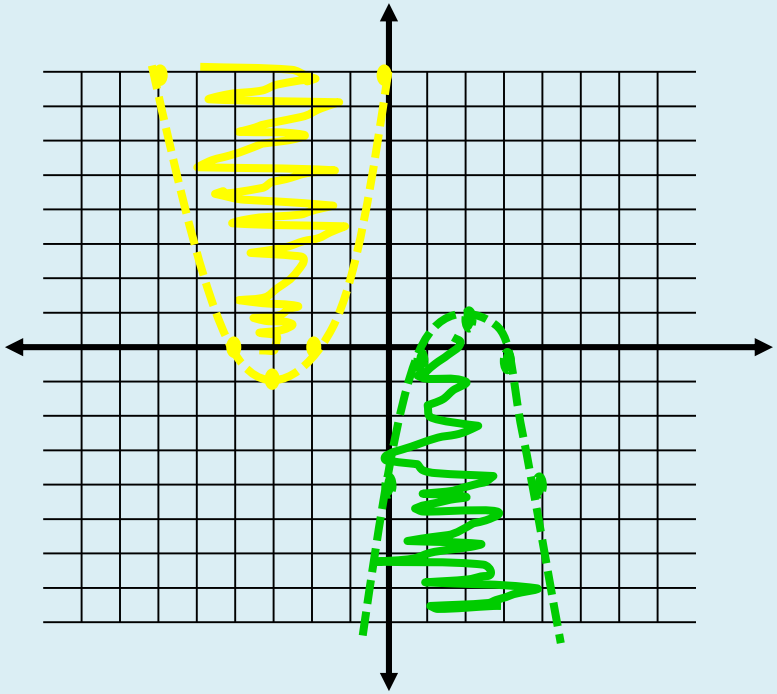


(-4, 0) and (0, 12) are parabola's intersections

BUT the dark area is the solution!! ☺

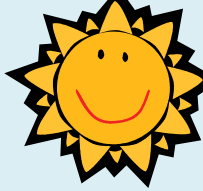
2) $y < -x^2 + 4x - 3$

$y > x^2 + 6x + 8$



No Solution

Warm Up Answers



Factor completely

3) $81x^4 - 16$

$(9x^2 - 4)(9x^2 + 4)$

$(3x+2)(3x-2)(9x^2+4)$

4) $12x^2 + 26x - 10$

$2(6x^2 + 13x - 5)$

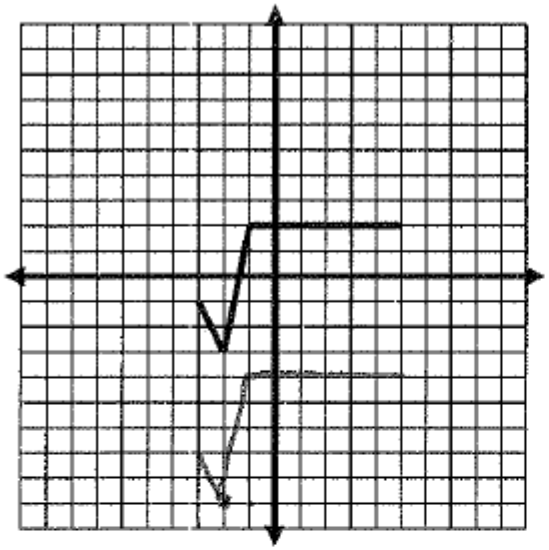
$2[6x^2 + 15x - 2x - 5]$

$2[3x(2x + 5) - 1(2x + 5)]$

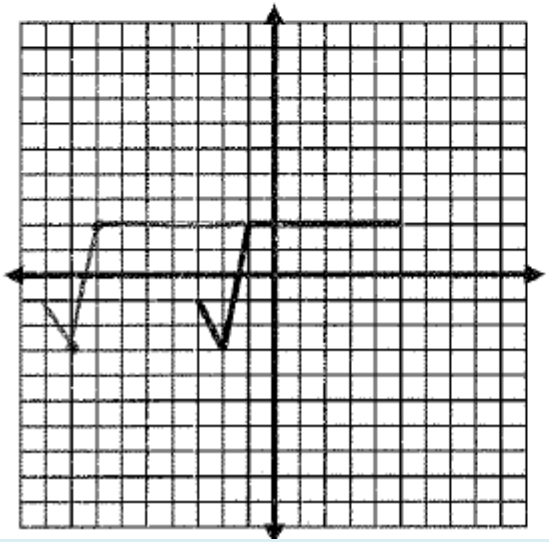
$2(3x - 1)(2x + 5)$

Homework Answers – Packet p. 13

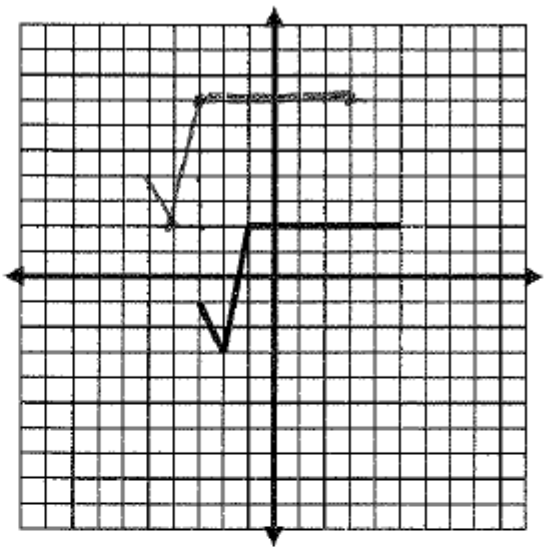
1. Graph: $y = G(x) - 6$.



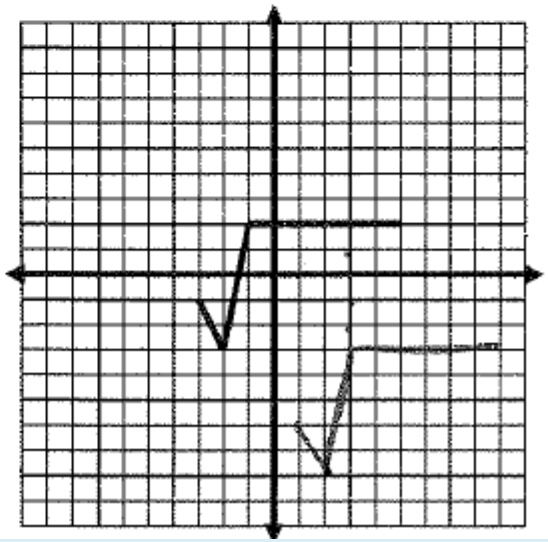
2. Graph: $y = G(x + 6)$



3. Graph: $y = G(x + 2) + 5$



4. Graph: $y = G(x - 4) - 5$



Homework Answers – Packet p. 13

Equation	Effect to Harry's graph
1. y=F(x) + 82	**Translate up 82**
2. y = F(x-13)	**Translate right 13**
3. y = F(x + 9)	**Translate left 9**
4. y = F(x) - 55	**Translate down 55**
5. y = F(x – 25) + 11	**Translate right 25, up 11**

Homework Answers – Packet p. 14

Equation	Effect to Harry's graph
$y = F(x + 51)$	Translate left 51
$y = F(x) - 76$	Translate down 76
$y = F(x – 31)$	Translate right 31
$y = F(x – 8) - 54$	Translate right 8 and down 54
$y = F(x + 100) - 12$	Translate down 12 an left 100

Homework Answers – Packet p. 14

IV.

1. D: $\{x \mid -1 \leq x \leq 3\}$
   R: $\{y \mid -5 \leq y \leq 3\}$

2. D: $\{x \mid -3 \leq x \leq 5\}$
   R: $\{y \mid -3 \leq y \leq 2\}$

V.

1. D: $\{x \mid -2 \leq x \leq 2\}$
   R: $\{y \mid 2 \leq y \leq 6\}$

2. D: $\{x \mid -7 \leq x \leq -3\}$
   R: $\{y \mid -3 \leq y \leq 1\}$

Tonight's Homework:

Packet p. 15-16

AND

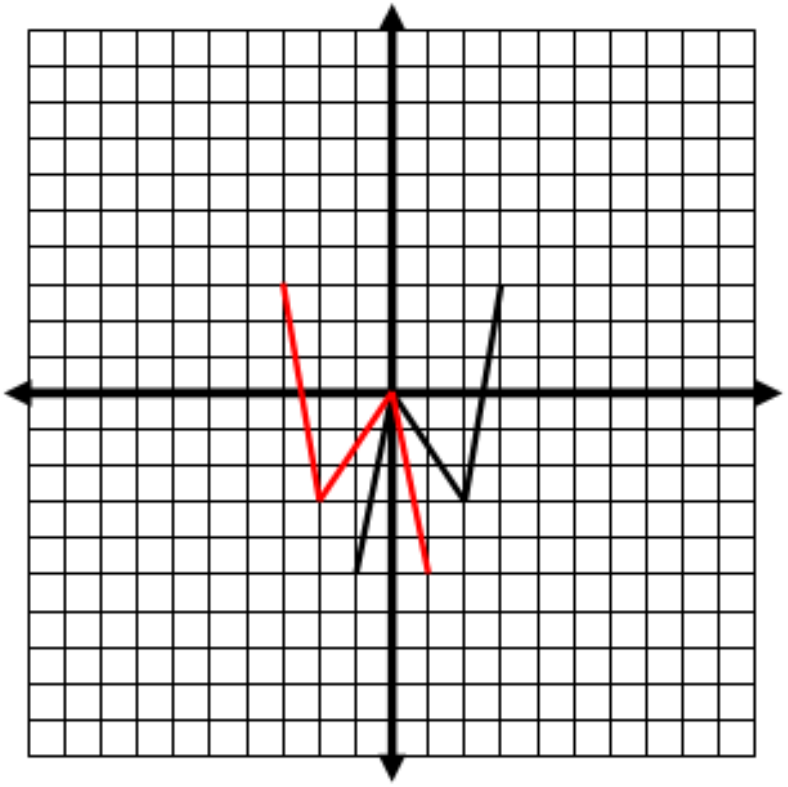
Finish today's Fred Function Notes through Notes p. 44

Fred Functions Notes
p. 39-44

*Work together with your neighbors
*Ask Questions as needed!
*After you complete a checkpoint, check in to be sure you're on the right track!

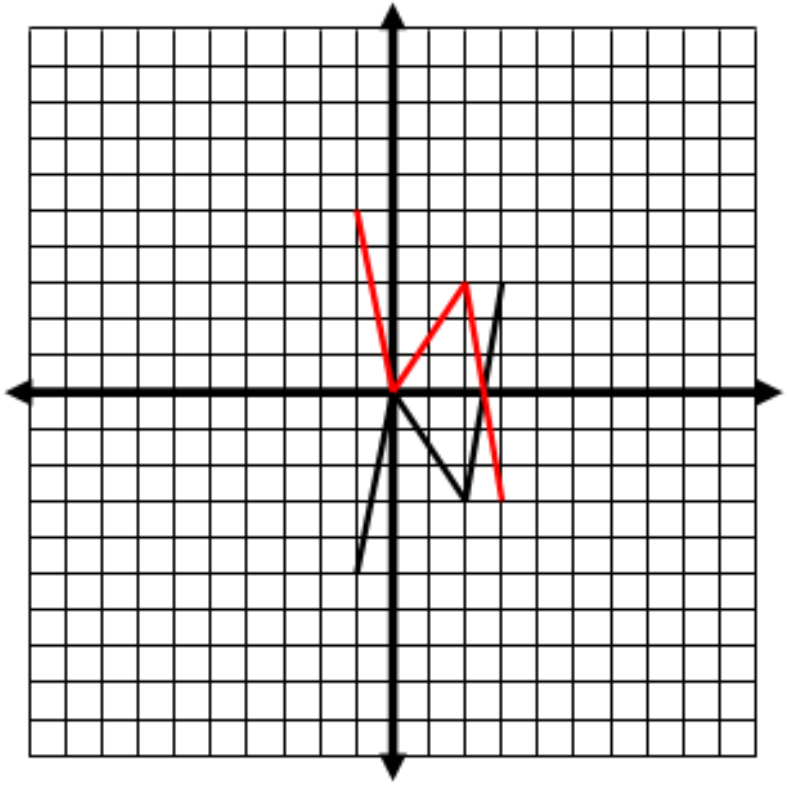
III. Checkpoint p. 40

1. $y = H(-x)$ reflection in y-axis



Reflection in the y-axis

2. $y = -H(x)$ reflection in x-axis



Reflection in the x-axis

VI. Checkpoint p. 42

1. Complete each chart below. Each chart starts with the characteristic points of Fred.

x	F(x)	3 F(x)
–1	1	3
1	–1	–3
2	–1	–3
4	–2	–6

x	F(x)	¼ F(x)
–1	1	¼
1	–1	–¼
2	–1	–¼
4	–2	–½

2. Compare the 2nd and 3rd columns of each chart above. The 2nd column is the y-value for Fred. Can you make a conjecture about how a coefficient changes the parent graph?

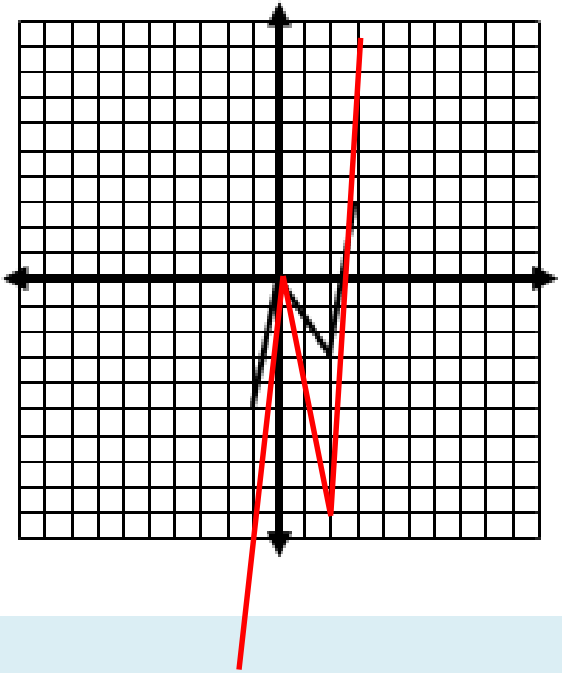
Students will likely say that a coefficient greater than 1 stretches the graph (makes it taller/steeper) and a coefficient less than 1 compresses it (makes it shorter/less steep). This is not fully accurate but will be addressed in the next investigation.

VIII. Checkpoint p. 43

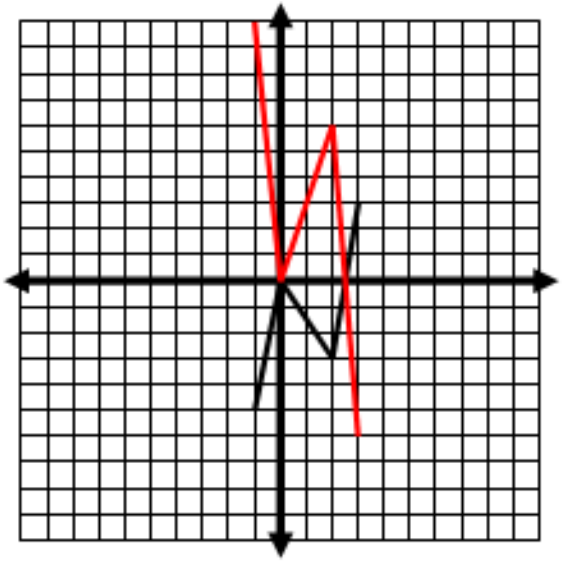
Equation	Effect to Harry's graph
Example: y=-5H(x)	**Reflect over x-axis, vertical stretch by 5**
d. y = 3H(x)	**Vertical stretch by 3**
e. y = -2H(x)	**Reflect over x-axis, vertical stretch by 2**
f. y = 1/2H(x)	**Vertical compression by 1/2**

VIII. Checkpoint (con't) p. 43

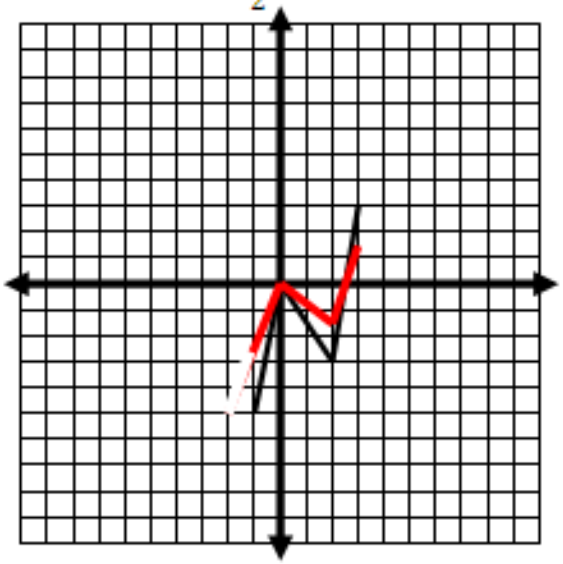
a. $y = 3H(x)$



b. $y = -2H(x)$



c. $y = \frac{1}{2}H(x)$



Practice
p. 43-44

Part A: The Effect of *a*

1. $y = 4x^2$

Vertex: (0, 0)
Shape Change or Shift Change? : Shape
What was the change?

Vertical stretch by 4

2. $y = \frac{1}{4}x^2$

Vertex: (0, 0)
Shape Change or Shift Change? : Shape
What was the change? :

Vertical compression (or horizontal stretch) by ¼

3. $y = -4x^2$

Vertex: (0, 0)
Shape Change or Shift Change? : Both
What was the change? :

Vertical stretch by 4 and reflection over x-axis

4. $y = -\frac{1}{4}x^2$

Vertex: (0, 0)
Shape Change or Shift Change? : Both
What was the change? :

Vertical compression (or horizontal stretch) by ¼ and reflection over x-axis

Part B: The Effect of *h*

5. $y = (x+2)^2$

Vertex: (-2, 0)
Shape Change or Shift Change? : Shift
What was the change?

Translation left 2

6. $y = (x-4)^2$

Vertex: (4, 0)
Shape Change or Shift Change? : Shift
What was the change? :

Translation right 4

7. $y = -(x+5)^2$

Vertex: (-5, 0)
Shape Change or Shift Change? : Shift
What was the change? :

Translation left 5 and reflection over x-axis

8. $y = -(x-6)^2$

Vertex: (6, 0)
Shape Change or Shift Change? : Shift
What was the change? :

Translation right 6 and reflection over x-axis

Part C: The Effect of *k*

9. $y = x^2 + 1$

Vertex: (0, 1)
Shape Change or Shift Change? : Shift
What was the change?

Translation up 1

10. $y = x^2 - 2$

Vertex: (0, -2)
Shape Change or Shift Change? : Shift
What was the change? :

Translation down 2

11. $y = -x^2 + 7$

Vertex: (0, 7)
Shape Change or Shift Change? : Shift
What was the change? :

Reflection over x-axis and translation up 7

12. $y = -x^2 - 10$

Vertex: (0, -10)
Shape Change or Shift Change? : Shift
What was the change? :

Reflection over x-axis and translation down 10

Tonight's Homework:

Packet p. 15-16

AND

Finish today's Fred Function Notes through Notes p. 44