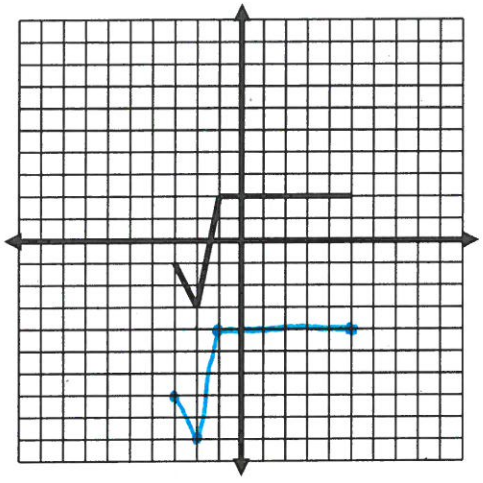
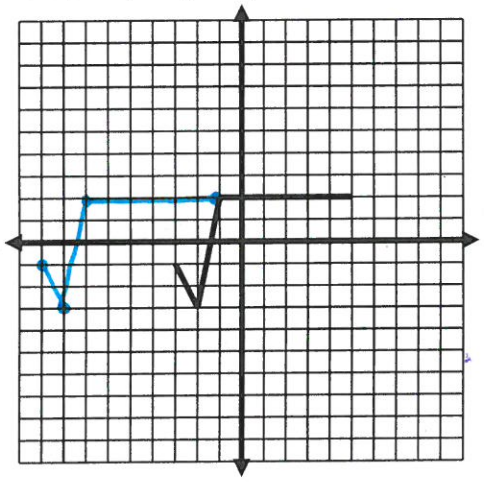
HW Day 1:

On each grid, **Ginger, G(x)** is graphed. Graph the given function.

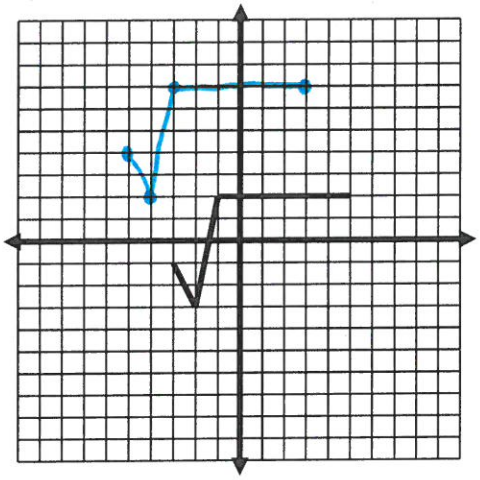
1. Graph: $y = G(x) - 6$.



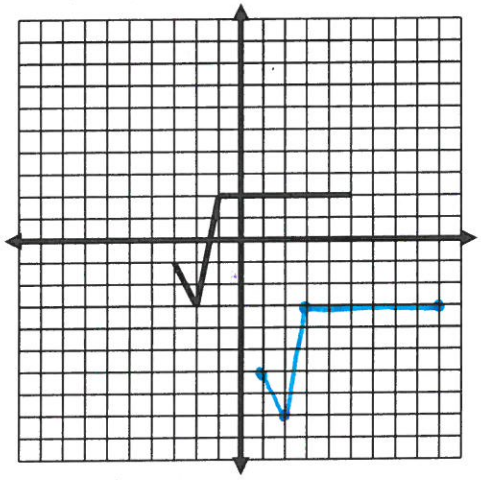
2. Graph: $y = G(x + 6)$



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



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



Using the understanding you have gained so far, describe the effect to Fred for the following functions.

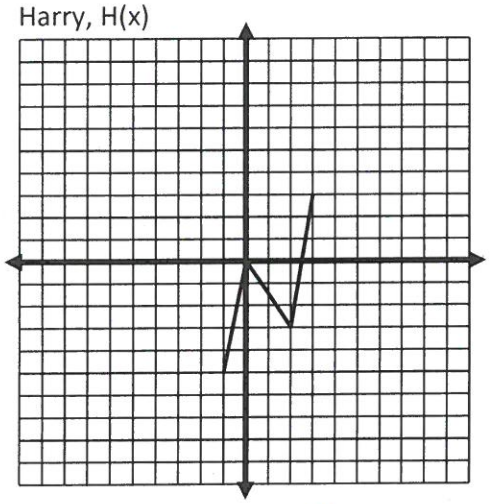
Equation	Effect to Fred's graph
1. $y = F(x) + 82$	translate up 82
2. $y = F(x - 13)$	translate right 13
3. $y = F(x + 9)$	translate left 9
4. $y = F(x) - 55$	translate down 55
5. $y = F(x - 25) + 11$	translate right 25 & up 11

Using the understanding you have gained so far, write the equation that would have the following effect on Fred's graph.

	Equation	Effect to Fred's graph
1.	F(x+51)	Translate left 51 units
2.	F(x)-76	Translate down 76
3.	F(x-31)	Translate right 31
4.	F(x-8)-54	Translate right 8 and down 54
5.	F(x+100)-12	Translate down 12 and left 100

Determine the domain and range of each parent function.

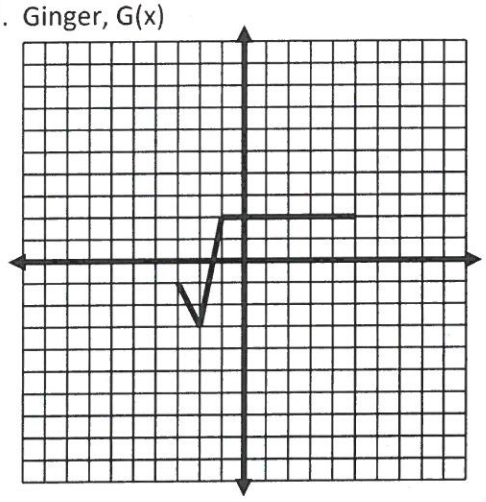
1. Harry, H(x)



Domain: [-1,3]

Range: [-5,3]

2. Ginger, G(x)



Domain: [-3,5]

Range: [-3,2]

Consider a new function, Polly, P(x).

Polly's Domain is $\{x| -2 \leq x \leq 2\}$. Its range is $\{y| -3 \leq y \leq 1\}$.

Use your understanding of transformations of functions to determine the domain and range of each of the following functions. *(Hint: You may want to write the effect to Polly first.)*

1. P(x) + 5 ← "up 5" translate

Domain: [-2,2]

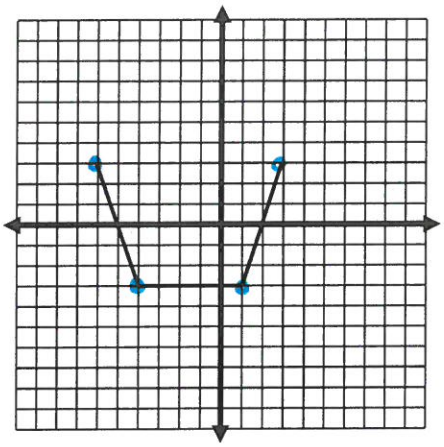
Range: [2,6]

2. P(x + 5) ← left 5 translate

Domain: [-7,-3]

Range: [-3,1]

This is the function **Bowl, B(x)**.



1. List its characteristic points.

   (-6,3), (-4,-3), (1,-3), (3,3)

2. Are these the only points on the graph of Bowl? Explain.

   No.

3. What is the domain of Bowl?

   [-6,3]

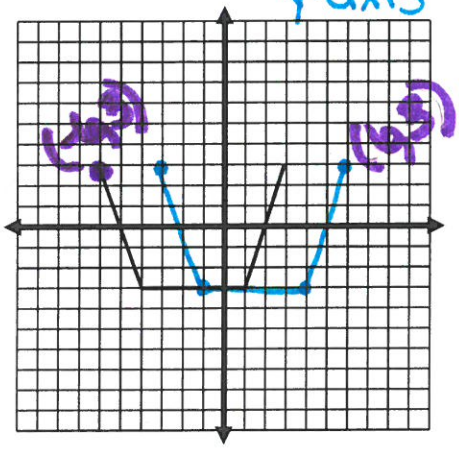
4. What is the range of Bowl?

   [-3,3]

For each of the following, list the effect on the graph of Bowl and then graph the new function.

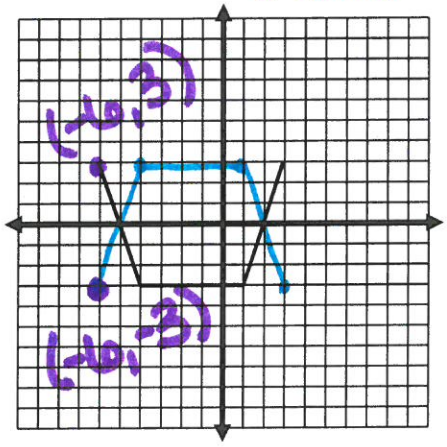
5. $y = B(-x)$

   Reflect over y-axis



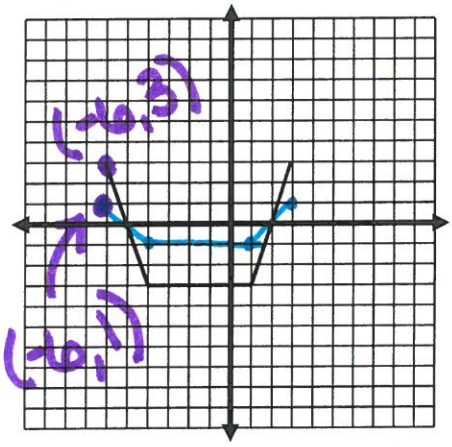
6. $y = -B(x)$

   Reflect over x-axis

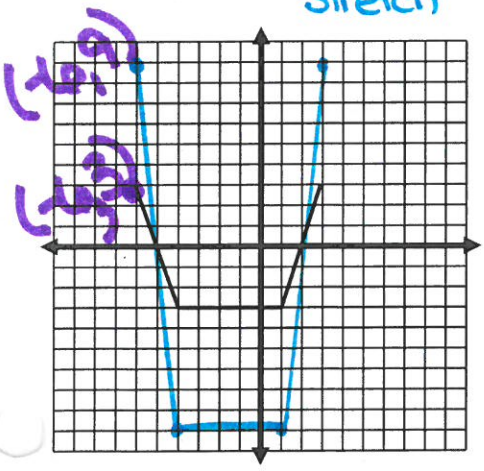


7. $y = \frac{1}{3}B(x)$

   vertical shrink

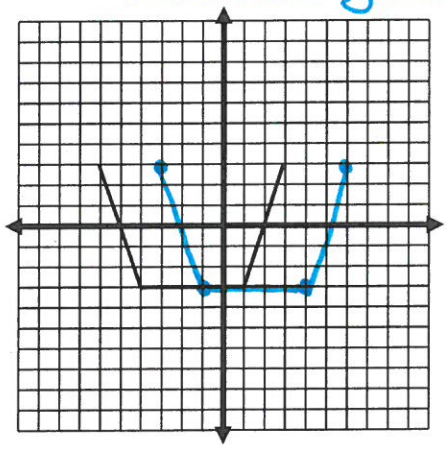


8. $y = 3\,B(x)$ vertical stretch



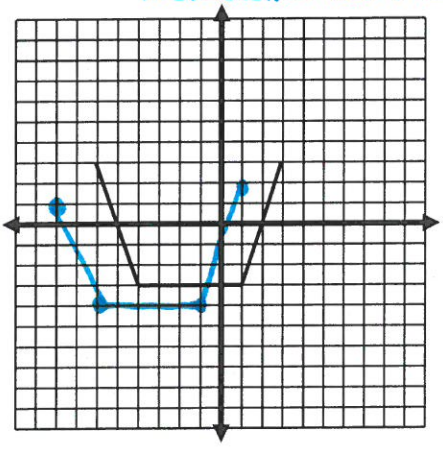
9. $y = B(x-3)$

   translate right 3



10. $y = B(x+2) - 1$

    translate left 2, down 1

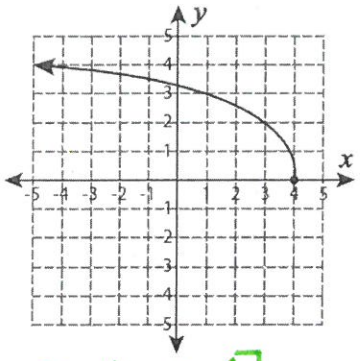


Homework Day 2

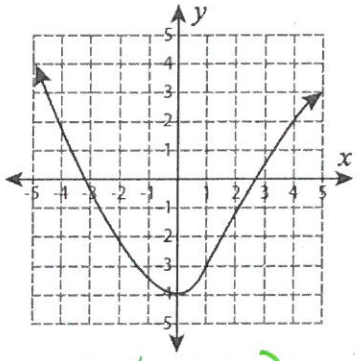
Domain and Range

MS1

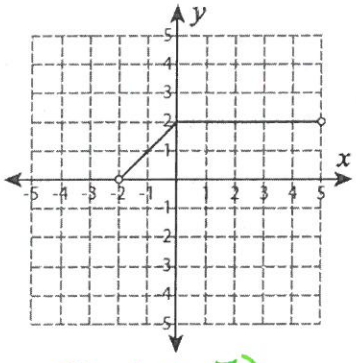
Find the domain and range for each graph.

1) 

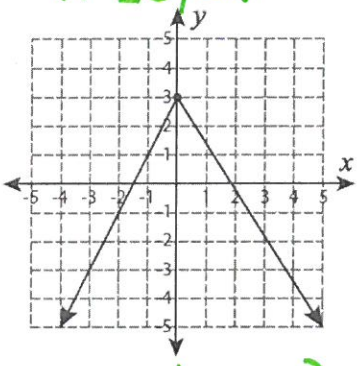
D: $(-\infty, 4]$
R: $[0, \infty)$

2) 

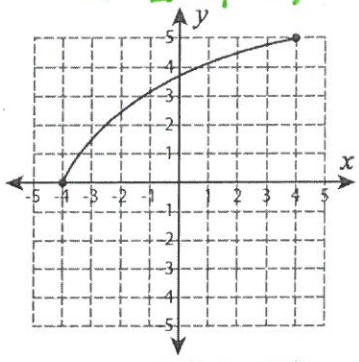
D: $(-\infty, \infty)$
R: $[-4, \infty)$

3) 

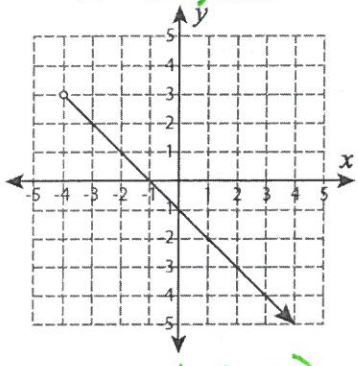
D: $(-2, 5)$
R: $(0, 2]$

4) 

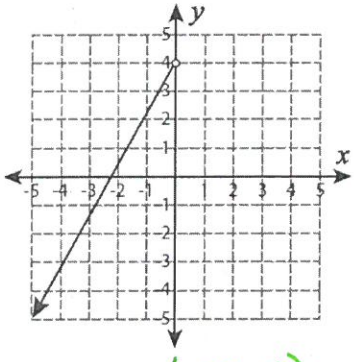
Domain : $(-\infty, \infty)$
Range : $(-\infty, 3]$

5) 

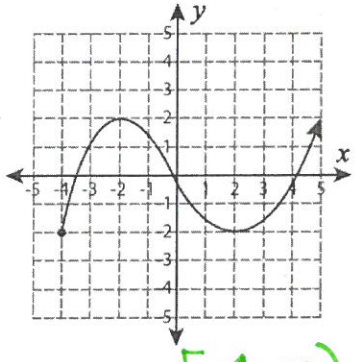
Domain : $[-4, 4]$
Range : $[0, 5]$

6) 

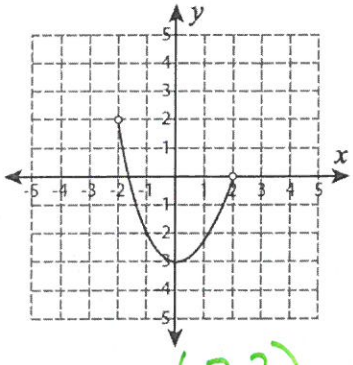
Domain : $(-4, \infty)$
Range : $(-\infty, 3)$

7) 

Domain : $(-\infty, 0)$
Range : $(-\infty, 4)$

8) 

Domain : $[-4, \infty)$
Range : $[2, \infty)$

9) 

Domain : $(-2, 2)$
Range : $[-3, 2)$

3

Day 4 Homework (Foundations skills needed for Unit 1)

1. Solve: $\frac{4}{x}=\frac{12}{15}$ $x=5$

2. Solve: $\frac{2}{x}=\frac{x}{18}$ $x=6$ $x=-6$

3. Solve: $\frac{5}{x+2}=\frac{15}{1}$ $x=-1\frac{2}{3}$

4. Segment Addition Postulate:

In the segment below,

AB = 3x + 9, BC = 4x – 7, AC = 37

What do x and AB equal?

$x=$ 5 AB = 24

A B C

$3x+9+4x-7=37$

5. Definition of a Midpoint:

In the segment below,

B is the midpoint of $\overline{AC}$.

AB = 4x + 12, BC = 6x - 8

What do *x* and AC equal?

$x=$ 10 AC = 52

A B C

$4x+12=6x-8$

6. Angle Addition Postulate:

SIDE NOTE: m∠1 is the shortcut way of writing "the measure of angle 1." It's like math texting – you write LOL instead of "laughing out loud," math people write m∠1 instead of "the measure of angle 1."

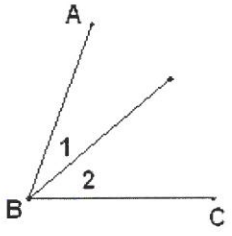
$m\angle 1 = 8x-2$

$m\angle 2 = 15x+5$

$m\angle ABC = 72°$

What is *x* equal to?

$x=$ 3



$8x-2+15x+5=72$

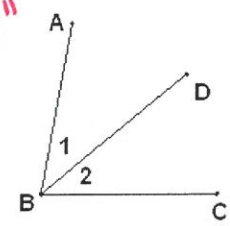
7. Angle Bisector:

"cut in half"

$\overrightarrow{BD}$ bisects $\angle ABC$

$m\angle 1 = 5x+12$

$m\angle 2 = 2x+21$



What are *x* and $m\angle ABC$?

$5x+12=2x+21$

$x=$ 3

$m\angle ABC=$ 54

For 8-9, suppose $\overline{RS} \cong \overline{MN}$. For each set, solve for x, and find the length of each segment.

8. RS = 6x + 17, MN = 7x – 15

$6x+17=7x-15$

x = 32 RS = 209 MN = 209

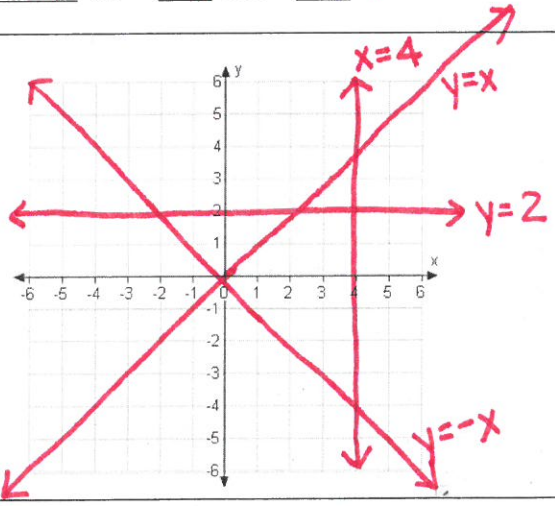
9. RS = 2x + 10, MN = 9x + 4

$2x+10=9x+4$

x = 6/7 RS = 82/7 MN = 82/7

10. Graph the following lines.

a. x = 4
b. y = 2
c. y = x (Hint: this is y = 1x + 0)
d. y = -x (Hint: this is y = -1x + 0)



Day 4 Homework : **Factor each trinomial.**

1. $x^2 - 9x + 14$
2. $a^2 - 9a - 36$
3. $x^2 + 2x - 15$
4. $n^2 - 8n + 15$
5. $b^2 + 22b + 21$
6. $c^2 + 2c - 3$
7. $x^2 - 5x - 24$
8. $n^2 - 8n + 7$
9. $m^2 - 10m - 39$
10. $z^2 + 15z + 36$
11. ~~$x^2 - 13xy - 30y^2$~~
12. $y^2 + 2y - 35$
13. $r^2 + 3r - 40$
14. $x^2 + 5x - 6$
15. ~~$x^2 - 4xy - 5y^2$~~
16. $r^2 + 16r + 63$
17. $v^2 + 24v - 52$
18. ~~$k^2 - 27kj - 90j^2$~~

Solve each equation. Check your solutions.

19. $a^2 + 3a - 4 = 0$
20. $x^2 - 8x - 20 = 0$
21. $b^2 + 11b + 24 = 0$
22. $y^2 + y - 42 = 0$
23. $k^2 + 2k - 24 = 0$
24. $r^2 - 13r - 48 = 0$
25. $n^2 - 9n = -18$
26. $2z + z^2 = 35$
27. $-20x + 19 = -x^2$
28. $10 + a^2 = -7a$
29. $z^2 - 57 = 16z$
30. $x^2 = -14x - 33$
31. $22x - x^2 = 96$
32. $-144 = q^2 - 26q$
33. $x^2 + 84 = 20x$

Factor: (Some of these may be prime)	Solve: (we have 5 methods...do not say "prime!!!")	Graph (use a separate sheet of graph paper):
34. $x^2 + 8x + 15$	$0 = x^2 + 8x + 15$	$y = x^2 + 8x + 15$
35. $x^2 + 8x - 12$	$x^2 + 8x = 12$	$y = x^2 + 8x - 12$
36. $x^2 + 8x$	$x^2 = -8x$	$y = x^2 + 8x$
37. $-x^2 + 9x - 18$	$-x^2 + 9x = 18$	$y = -x^2 + 9x - 18$

① $(x-7)(x-2)$ ② $(a-12)(a+3)$ ③ $(x+5)(x-3)$

④ $(n-3)(n-5)$ ⑤ $(b+21)(b+1)$ ⑥ $(c+3)(c-1)$

⑦ $(x-8)(x+3)$ ⑧ $(n-7)(n-1)$ ⑨ $(m-13)(m+3)$

⑩ $(z+12)(z+3)$ ⑪ skip ⑫ $(y+7)(y-5)$

⑬ $(r+8)(r-5)$ ⑭ $(x+6)(x-1)$ ⑮ skip

⑯ $(r+9)(r+7)$ ⑰ $(v+26)(v-2)$ ⑱ skip ☺

⑲ $a = -4, +1$ ⑳ $x = 10, -2$ ㉑ $b = -8, -3$

㉒ $y = -7, 6$ ㉓ $k = -6, 4$ ㉔ $r = 16, -3$

㉕ $n = 3, 6$ ㉖ $z = -7, 5$ ㉗ $x = 19, 1$

㉘ $a = -2, -5$ ㉙ $z = -3, 19$ ㉚ $x = -3, -11$

㉛ $x = 6, 16$ ㉜ $q = 18, 8$ ㉝ $x = 14, 4$

34. Factor

$x^2+8x+15$

$(x+3)(x+5)$

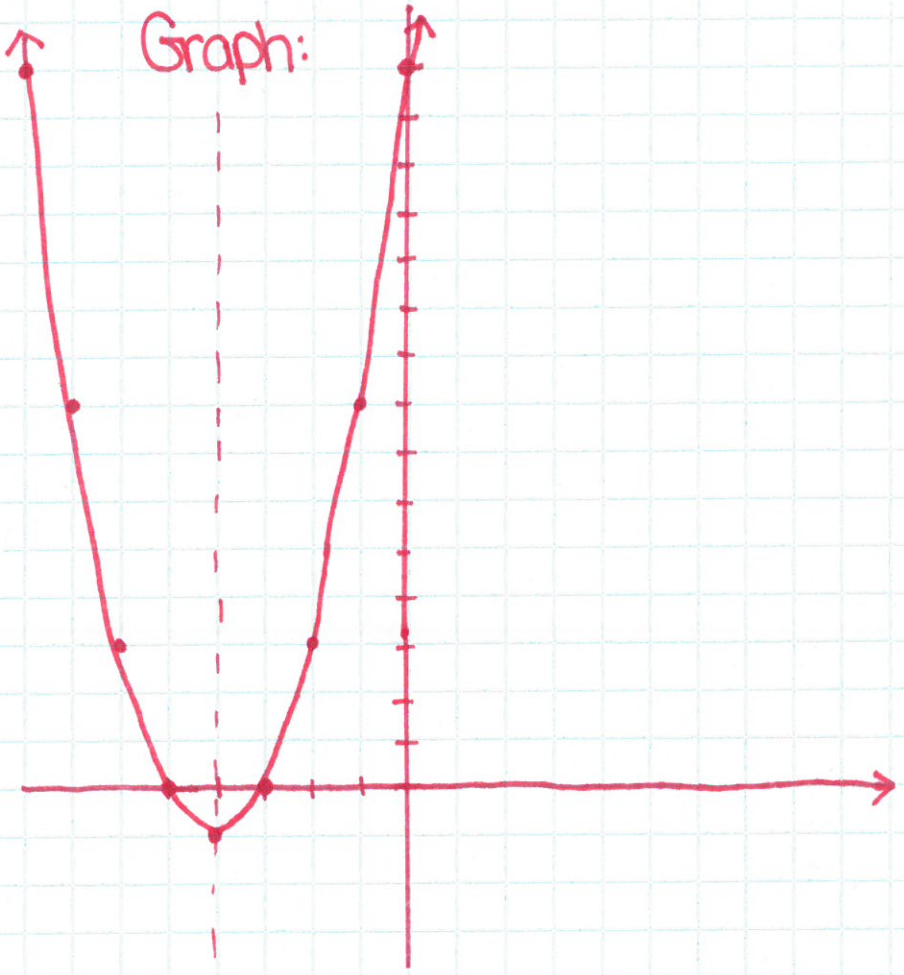
Solve

$x^2+8x+15=0$

$(x+3)(x+5)=0$

$x=-3, -5$

Graph:



35. Factor:

$x^2+8x-12$

Prime

Solve:

$x^2+8x-12=0$

$$x=\frac{-8\pm\sqrt{64-4\cdot1\cdot-12}}{2}$$

$$x=\frac{-8\pm\sqrt{112}}{2}$$

$$x=\frac{-8\pm\sqrt{4\cdot28}4\cdot7}{2}$$

$$x=\frac{-8\pm4\sqrt{7}}{2}$$

$$\boxed{x=-4\pm2\sqrt{7}}$$

Graph:

(36) Factor:

x^2+8x

$x(x+8)$

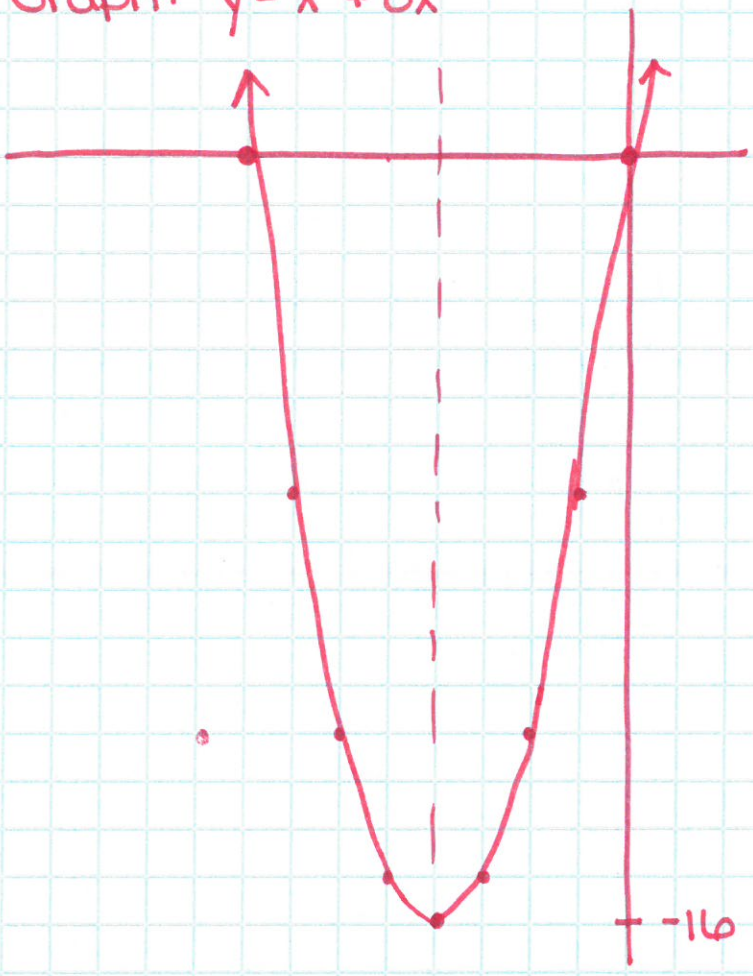
Solve:

$x^2+8x=0$

$x(x+8)=0$

$x=0, -8$

Graph: $y=x^2+8x$



(37) Factor: $-x^2+9x-18$

$= -1(x^2-9x+18)$

$= -1(x-6)(x-3)$

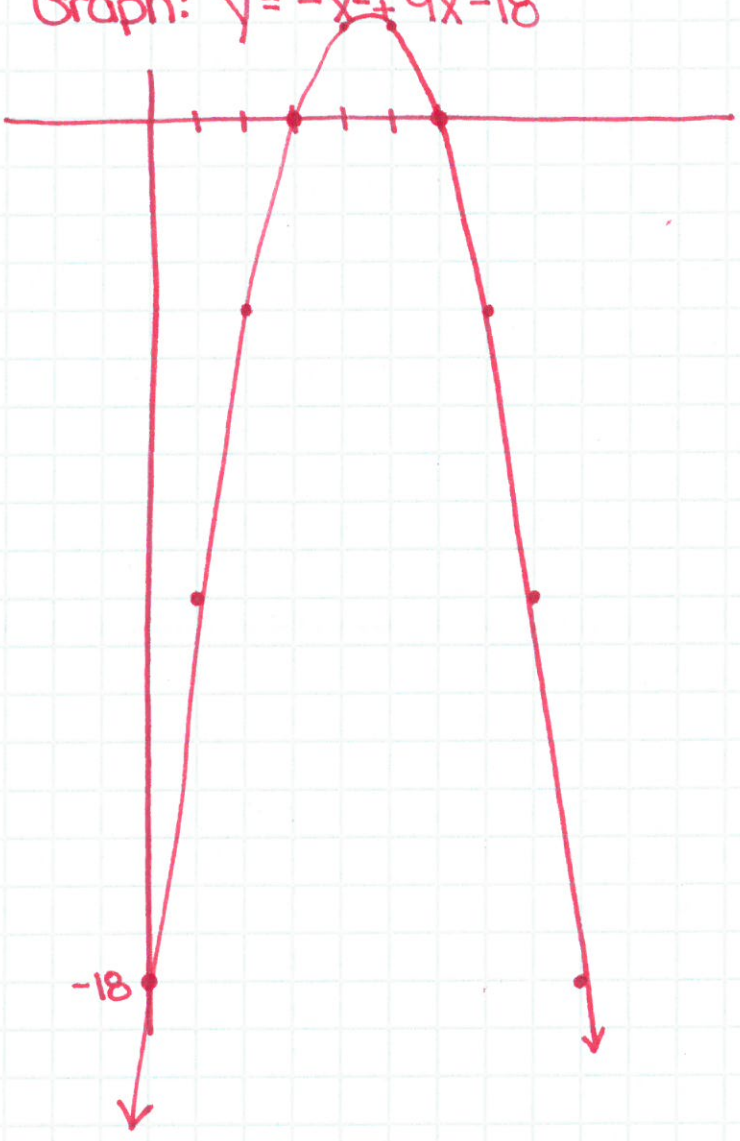
Solve: $-x^2+9x-18=0$

$-1\cdot(x-6)(x-3)=0$

$x-6=0 \quad x-3=0$

$x=6 \quad x=3$

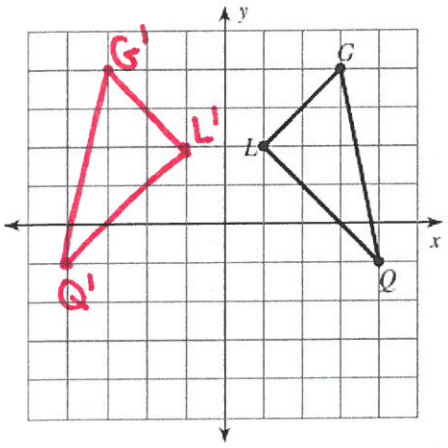
Graph: $y=-x^2+9x-18$



Day 5 Homework

Graph the image using the transformation given, write the proper notation, and give the algebraic rule as requested.

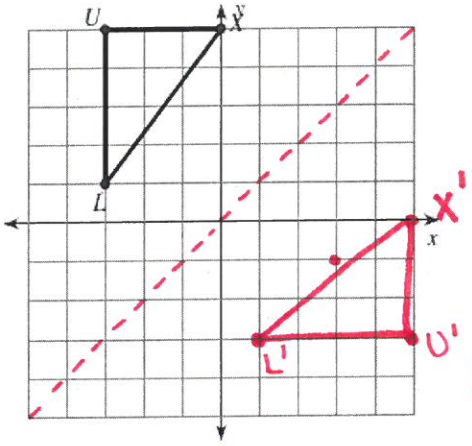
1) reflection across the y-axis



Notation: $R_{y\text{-axis}}$

Algebraic Rule: $(x,y) \rightarrow (-x,y)$

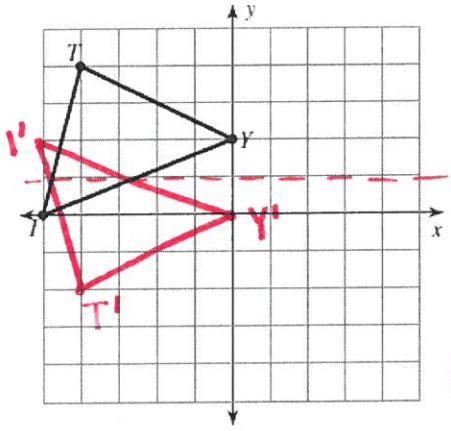
2) reflection across y = x



Notation: $R_{y=x}$

Algebraic Rule: $(x,y) \rightarrow (y,x)$

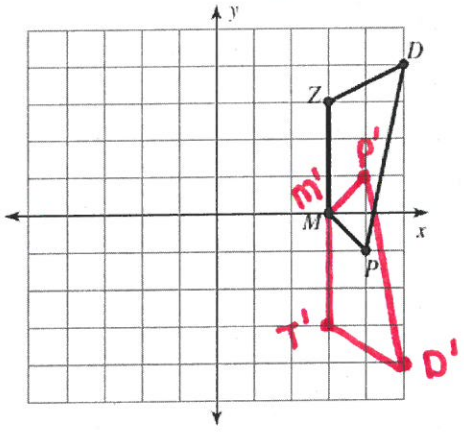
3) reflection across $y = 1$



Notation: $R_{y=1}$

Algebraic Rule: $(x,y) \rightarrow (x,-y+1)$

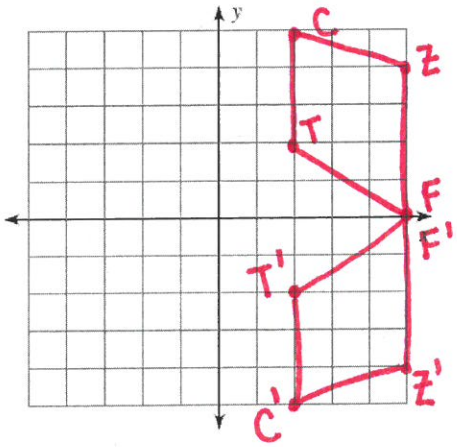
4) reflection across the x-axis



Notation: $R_{x\text{-axis}}$

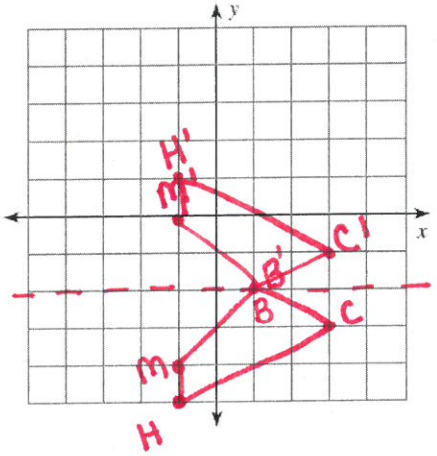
Algebraic Rule: $(x,y) \rightarrow (x,-y)$

5) reflection across the x-axis
$T(2, 2)$, $C(2, 5)$, $Z(5, 4)$, $F(5, 0)$



Algebraic Rule: $(x,y) \rightarrow (x,-y)$

6) reflection across $y = -2$
$H(-1, -5)$, $M(-1, -4)$, $B(1, -2)$, $C(3, -3)$



Algebraic Rule: $(x,y) \rightarrow (x,-y-4)$

Find the coordinates of the vertices of each figure after the given transformation and give the algebraic rule, as requested. *(Hint:* Using graph paper may help on these!)

7) Reflection across the x-axis → $(x,y) \to (x,-y)$
K(1, -1), N(4, 0), Q(4, -4)

K'(1,1), N'(4,0), Q'(4,4)

8) Reflection across y = -x → $(x,y) \to (-y,-x)$
R(-3, -5), N(-4, 0), V(-2, -1), E(0, -4)

R'(5,3), N'(0,4), V'(1,2) E'(4,0)

9) Reflection across x = 3 → $(x,y) \to (-x+6,y)$
F(2, 2), W(2, 5), K(3, 2)

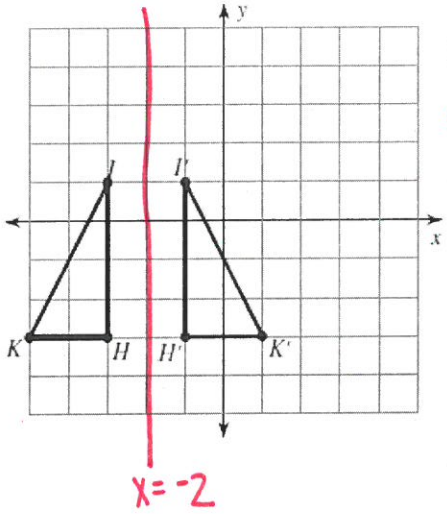
F'(4,2), W'(4,5), K'(3,2)

10) Reflection across x = -1 → $(x,y) \to (-x-2,y)$
V(-3, -1), Z(-3, 2), G(-1, 3), M(1, 1)

V'(1,-1), Z'(1,2), G'(-1,3), M'(-3,1)

Write a specific description of each transformation and give the algebraic rule, as requested.

11)

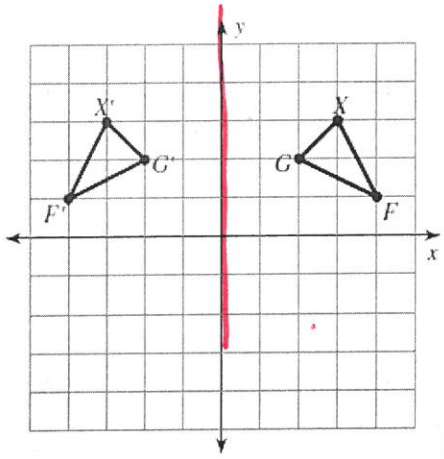


Description:

Reflected over x=2

x=-2

12)



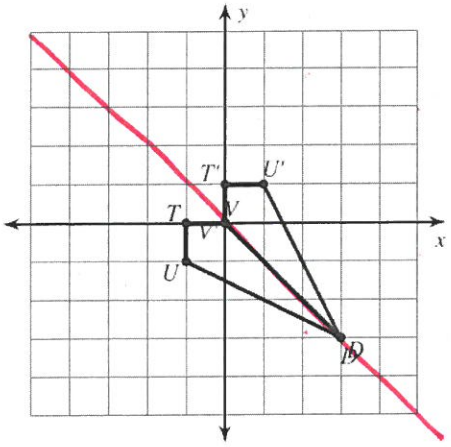
Description:

Reflected over y-axis

Algebraic Rule:

$(x,y) \to (-x,y)$

13)



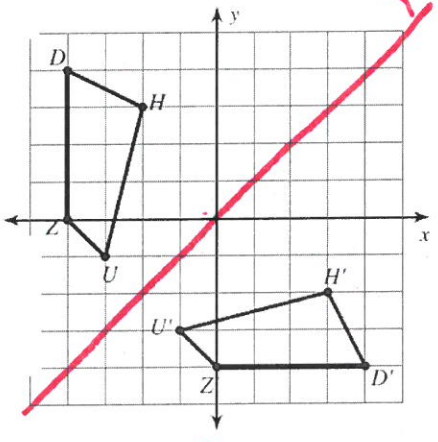
Description:

Reflected over y=-x

Algebraic Rule:

$(x,y) \to (-y,-x)$

14)



Description:

Reflected over y=x

Algebraic Rule:

$(x,y) \to (y,x)$