$f(x) = x^2 + 3$

$f(2)$

$f(4)$

$f(x+1)$

$g(x) = \frac{x}{2}$

$g(10)$

$g(6)$

$g(2x+10)$

$f(g(10))$

$f(x) = x^2 - 3x + 10$

$(\frac{-1}{2})^2 - 3(\frac{-1}{2}) + 10$

$\frac{1}{4} + \frac{3}{2} + 10 = 11\frac{3}{4}$

$(x+1)^2 - 3(x+1) + 10$

$x^2 + 2x + 1 - 3x - 3 + 10$

$x^2 - x + 8$

$g(x) = \frac{1}{x+2}$

$\frac{1}{\frac{5}{2}+2}$

$\frac{1}{\frac{5}{2}+\frac{4}{2}}$

$\frac{1}{\frac{9}{2}} = \frac{2}{9}$

$\frac{1}{(x^2-3)+2}$

$\frac{1}{x^2-1}$

$f(x) = x+1 \qquad g(x) = x^2-1$

A) $x+1-(x^2-1)$

$x+1-x^2+1$

$-x^2+x+2$

D) $(x+1)(x^2-1)$

x^3+x^2-x-1

B) $\frac{x+1}{x^2-1} \qquad \frac{x+1}{(x+1)(x-1)} = \frac{1}{x-1}$

C) $x+1+x^2-1 \qquad x^2+x$

ws 2.5

	A	B
17	1	-23
18	16	-47
19	-11	-119
20	-29	-2
21	$-3x^2+11$	$-9x^2+30x-23$
22	$9x-20$	

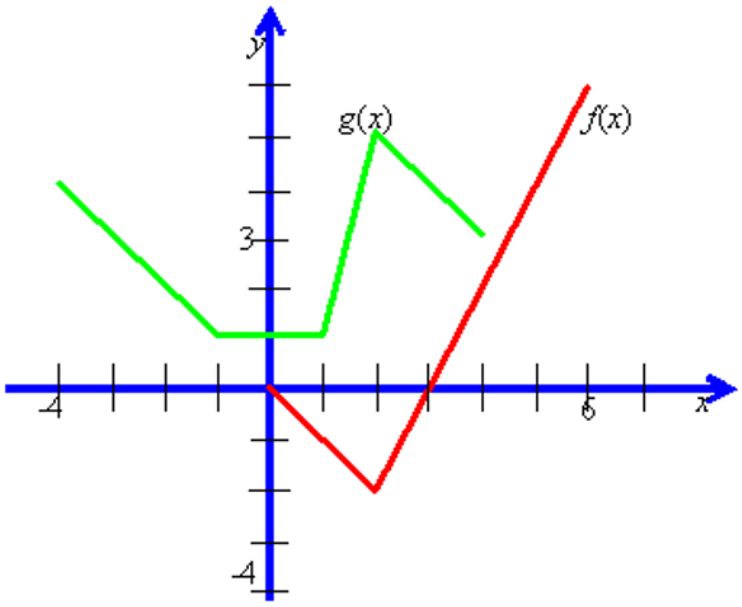
day 2-warm-up

1 $f(x)=x^2$ $g(x)=\sqrt{x-3}$

find f(g(x))

2 $f(x)=x^2$ $g(x)=x+1$

find f(g(x))



1. $f(g(1))$
2. $f(g(0))$
3. $f(1)-g(1)$
4. $g(f(1))$
5. $g(f(3))$

p 129 23-28

23) $j(f(h(x)))$

24) $g(f(h(x)))$

25) $f(j(h(x)))$

26 $g(h(f(x)))$

25. $f(x) = 2x - 3$

(a) $f(1)$ (b) $f(-3)$ (c) $f(x - 1)$

26. $g(y) = 7 - 3y$

(a) $g(0)$ (b) $g\left(\frac{7}{3}\right)$ (c) $g(s + 2)$

27. $V(r) = \frac{4}{3}\pi r^3$

(a) $V(3)$ (b) $V\left(\frac{3}{2}\right)$ (c) $V(2r)$

28. $h(t) = t^2 - 2t$

(a) $h(2)$ (b) $h(1.5)$ (c) $h(x + 2)$

29. $f(y) = 3 - \sqrt{y}$

(a) $f(4)$ (b) $f(0.25)$ (c) $f(4x^2)$

83. $g(x) = \frac{1}{x^2}$, $\frac{g(x) - g(3)}{x - 3}, x \neq 3$

84. $f(t) = \frac{1}{t - 2}$, $\frac{f(t) - f(1)}{t - 1}, t \neq 1$

85. $f(x) = \sqrt{5x}$, $\frac{f(x) - f(5)}{x - 5}, x \neq 5$

86. $f(x) = x^{2/3} + 1$, $\frac{f(x) - f(8)}{x - 8}, x \neq 8$

79. $f(x) = x^2 - x + 1, \quad \dfrac{f(2+h) - f(2)}{h}, h \neq 0$

$f(2+h)$

$(2+h)^2 - (2+h) + 1$

$4 + 4h + h^2 - 2 - h + 1$

$h^2 + 3h + 3 \quad - 3$

$\dfrac{h^2 + 3h}{h} \qquad h + 3$

$f(2)$

$2^2 - 2 + 1$

$4 - 2 + 1$

3

80. $f(x) = 5x - x^2, \quad \dfrac{f(5+h) - f(5)}{h}, h \neq 0$

$5(5+h) - (5+h)^2$

$25 + 5h - (25 + 10h + h^2)$

$5 + 5h - 25 - 10h - h^2$

$-h^2 - 5h \qquad \dfrac{-h^2 - 5h}{h} = -h - 5$

$5(5) - 5^2$

$25 - 25$

0

82. $f(x) = 4x^2 - 2x, \quad \frac{f(x+h) - f(x)}{h}, h \neq 0$

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

$4(x^2 + 2xh + h^2) - 2x - 2h$

$4x^2 + 8xh + 4h^2 - 2x - 2h - (4x^2 - 2x)$

$-4x^2 + 2x$

$$\frac{8xh + 4h^2 - 2h}{h}$$

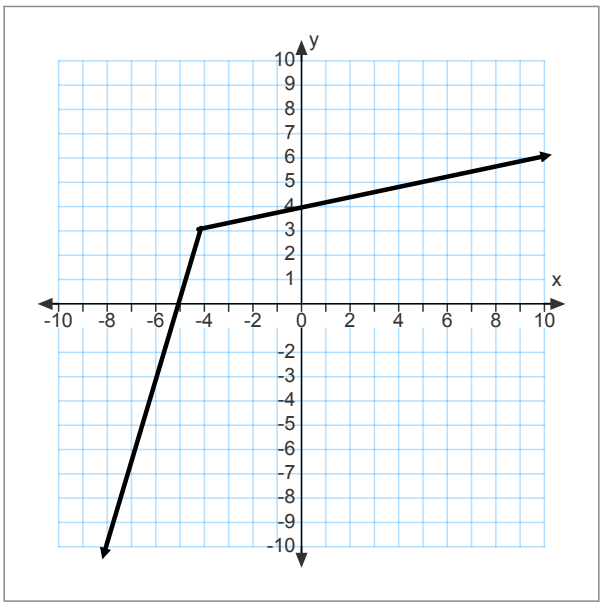
$8x + 4h - 2$

83) $\frac{1}{x^2}$

$$\frac{\frac{1}{x^2} - \frac{1}{9}}{x-3} \qquad \frac{\frac{9-x^2}{9x^2}}{x-3}$$

$$\frac{9-x^2}{9x^2} \cdot \frac{1}{x-3} =$$

$$\frac{-1(-3+x)}{(3-x)(3+x)} \cdot \frac{1}{x-3} = \frac{-(3+x)}{9x^2}$$



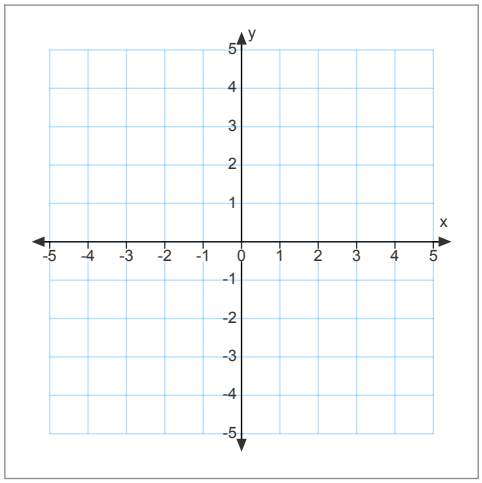
write the equation of this piecewise function

$$y = \begin{cases} \\ \end{cases}$$

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

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

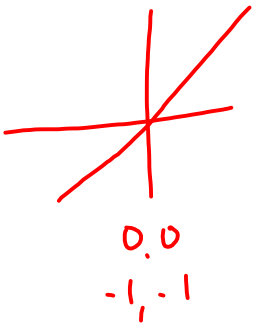
$$\frac{1+x-2}{x-2} \quad \frac{x-1}{x-2} \cdot \frac{1}{x-1} = \boxed{\frac{1}{x-2}}$$

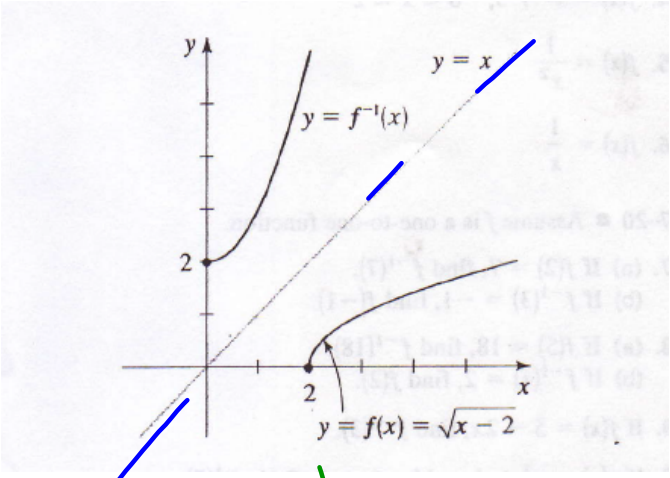


sketch the piecewise function

$$f(x)=\begin{cases} x^2+1, & x>0 \\ x, & x\le 0 \end{cases}$$

x^2+1
0 | 1
1 | 2
2 | 5





slides 80,81

83,85, 90, 94, 95

96,97

4-2 review Find the Domain of the function

1. $F(x) = 5x^2+2x -1$ $(-\infty,\infty)$

2. $F(X) = 1-2x^2$ $(-\infty,\infty)$

3. $F(X) = \frac{4}{X}$ $(-\infty,0)\cup(0,\infty)$

4. $F(X) = \sqrt{X-10}$ $x-10\geq 0$ $[10,\infty)$
$+10\ \ +10$
$x\geq 10$

5. $F(X) = \frac{3X}{X-5}$ $(-\infty,5)\cup(5,\infty)$

(4)

$f(x)=x^2-x+1$

$\frac{f(2+h)-f(2)}{h}$

$f(x)=x^2-x+1$

$f(2) = 4-2+1$

$\frac{f(2+h)-f(2)}{h}$

$(2+h)^2-(2+h)+1$

$4+4h+h^2-2-h+1$

$h^2+3h+3-3$

$\frac{h^2+3h}{h} = h+3$

31 $y^{-1} = \frac{x-1}{2}$

33. $y^{-1} = \frac{x-7}{4}$

35. $y^{-1} = 2x$

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

39. $y^{-1} = \frac{5x-1}{2x+3}$

41. $y^{-1} = \frac{x^2-2}{5}$

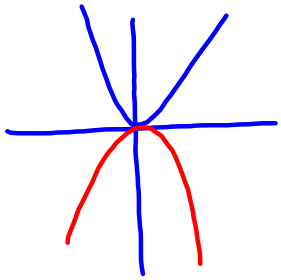
43. $y^{-1} = \pm\sqrt{-x+4}$

45. $y^{-1} = (x-4)^3$

47. $y^{-1} = x^2-2x$

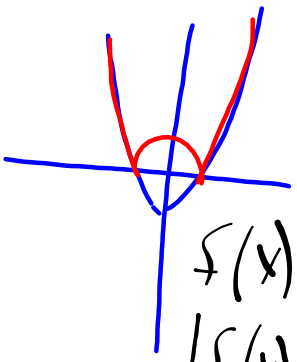
49. $y^{-1} = \sqrt[4]{x}$

$y = x^2$
$y = -x^2$



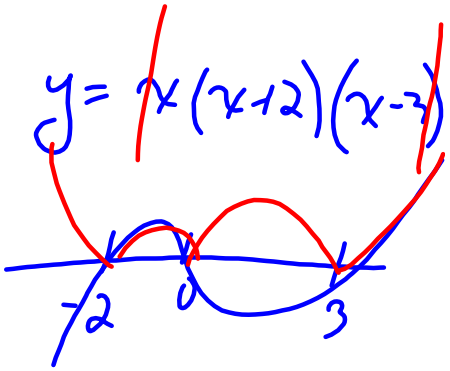
$f(x)$
$-f(x)$ = Reflects over x-axis

$y = x^2 - 1$
$y = |x^2 - 1|$

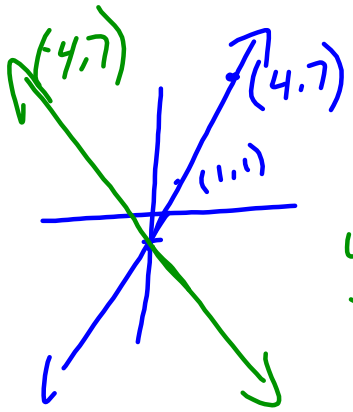


$f(x)$
$|f(x)|$ - neg part Reflects up

$y = x(x+2)(x-3)$



$y = 2x - 1$
$y = 2(-x) - 1$



$y = -2(-x) - 1$

$f(x)$:
$f(-x)$: Reflect over y-axis

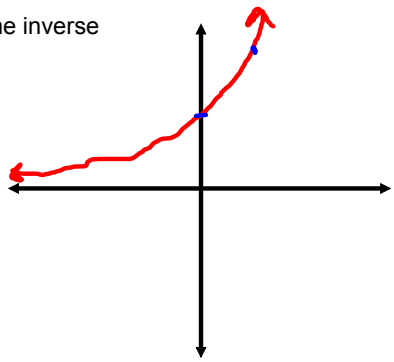
$-f(x)$: over x

$f(-x)$: Reflect over y-

$f(-x)$

Topics for ch 4 test
Domain, Range
Piecewise functions
Functions- add , sub, f(g(x)) and g(f(x)
Reflecting functions over the x and y axis-
Absolute value of functions
Inverse functions
odd and even
transformations

draw the inverse



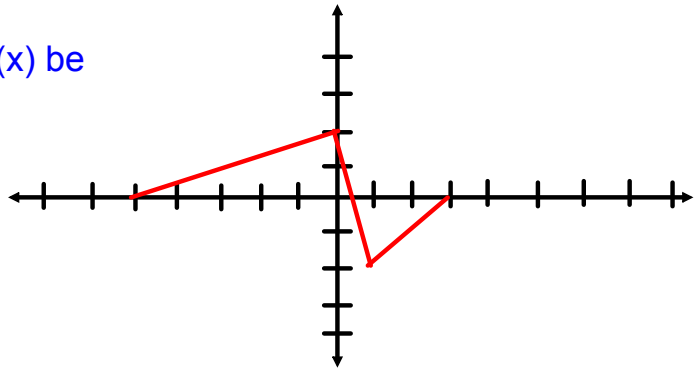
$f(x) = 3x^2 + 2x$

g(x) = 2x-4

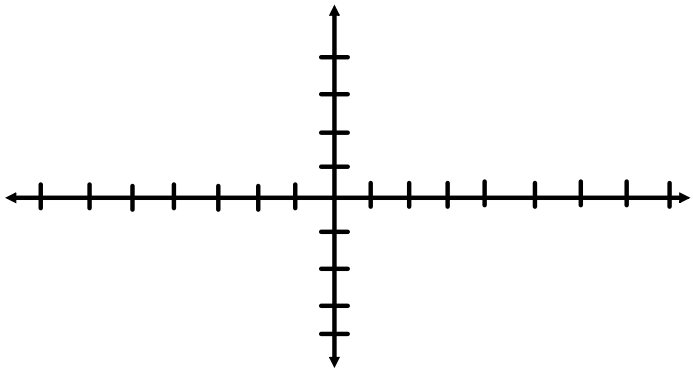
find h(x)

$h(x) = f(x) - g(x)$

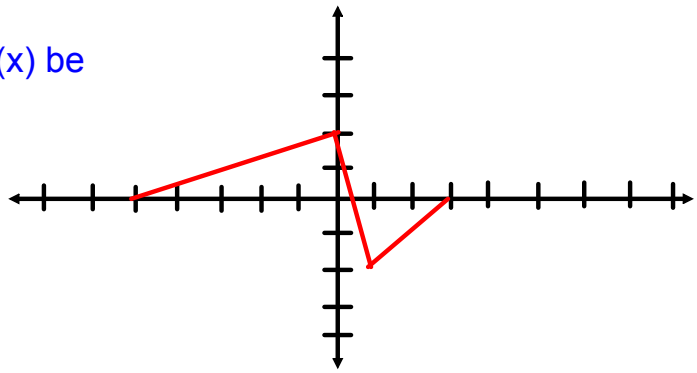
Let the graph of f(x) be



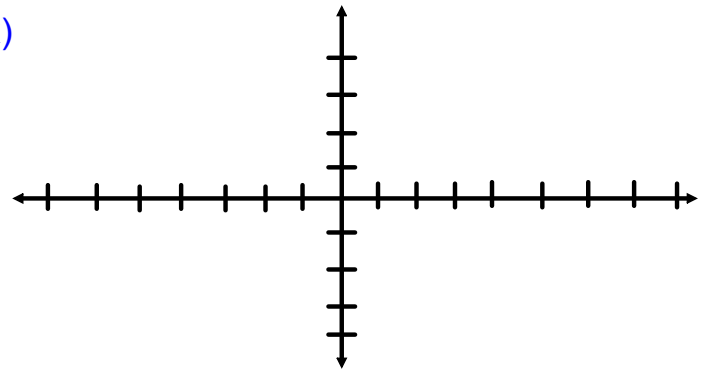
Graph y = f(-x)



Let the graph of f(x) be



Graph y = - f(x)

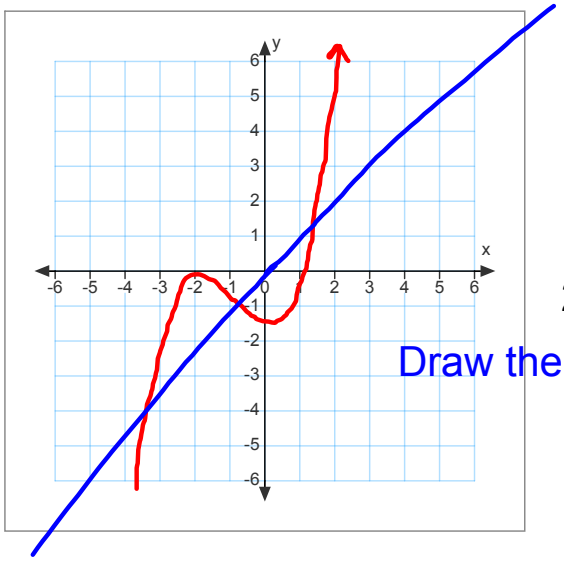


sketch

$$f(x)=\begin{pmatrix} x\ +5,\ x<-4 \\ \frac{x}{4}+2,\ -4\le x\le 4 \\ -\frac{x}{2}+5, 4<x \end{pmatrix}$$

1. $f(x)=x+1 \qquad g(x)=3x-1 \qquad h(x)=|x|$

$$f \circ h \circ g(0)$$



2

Draw the inverse of the given function

85. $f(x)=\sqrt{5x}, \qquad \dfrac{f(x)-f(5)}{x-5}, x \neq 5$

MATH ANALYSIS I HONORS
NAME _____
REVIEW TEST 2012 DATE
CHAPTER 4 Functions 100pts PERIOD

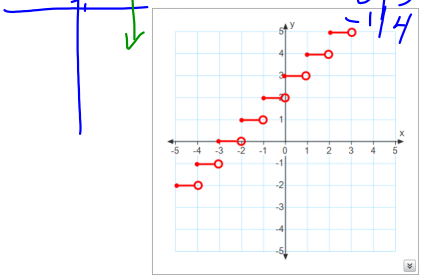
1. Use the following functions f(x) = -2x
g(4) 16 (f+g)(x)x^2-2x+7 f(g(2)) -1
g(f(-1) 81 f·g(x)) $-2x^2$+7 f(g(x+3))
$-2x^2$-12x-11

2. What is the domain of : (Write in interval n

F(x)= $\frac{2}{x+2}$ (-∞,-2) U (-2,∞) F(x)= $\sqrt{x-7}$ [7,∞)
+2x-1(-∞,∞)

3. Graph the following piecewise function

$$f(x)=\begin{cases} x^2+3, & x\le 1 \\ -x^2+4x+3, & x>1 \end{cases}$$



$$F(x)=\begin{cases} x^2+3, & x\le 1 \\ -x^2+4x+3, & x>1 \end{cases}$$

4. What is the domain and range of this functi

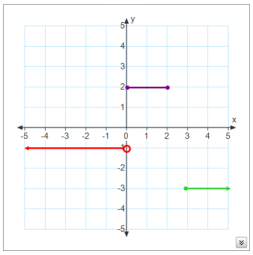
Domain-

Range-

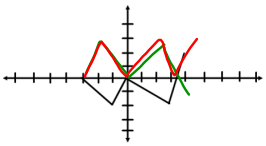
5. Using $\begin{cases} 4-5x & x\le -2 \\ 0, & -2<x<2 \\ x^2+1, & x>2 \end{cases}$

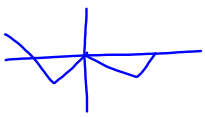
Evaluate f(-3) f(4) f(-1)

7. Write an equation of the following piecewise function



$$y=\begin{cases} -1 & (-\infty,0) \\ 2 & [0,2] \\ -3 & [2,\infty) \end{cases}$$



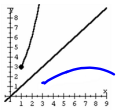


8. The graph of y=f(x) is shown at right. Sketch the graph of each of the following equations.

Y=-f(x)

Y=| $f(x)$|

Y= f(-x)



9. Draw the inverse of the graphed function
(it reflects over the y=x axis

10. Find the the inverse function

f(x) = 3x+2 $\frac{x-2}{3}$

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