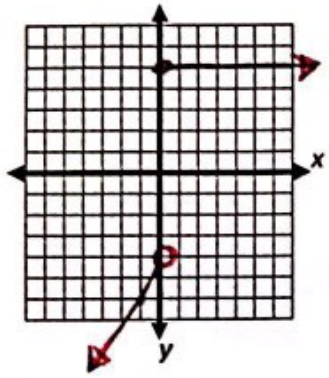
2017

Algebra 2 Honors
WS: Chapter 6 Review

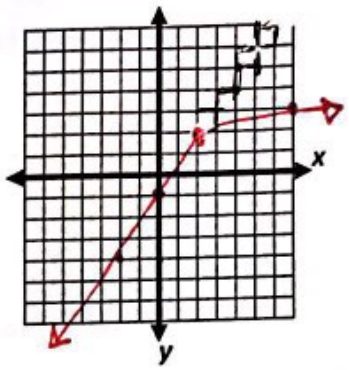
Name Key
Date 3/22, 3/23 Block 2A, 1B

Part I: Graphing
Graph each function.

1. $f(x)=\begin{cases}2x-4, & x<0\\ 5, & x\geq 0\end{cases}$ p. 469 #9

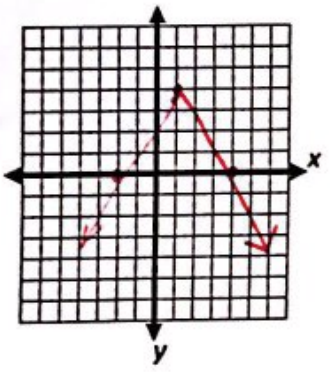


2. $g(x)=\begin{cases}\frac{3}{2}x-1, & x\leq 2\\ \sqrt{x+2}, & x>2\end{cases}$ p. 469 #10

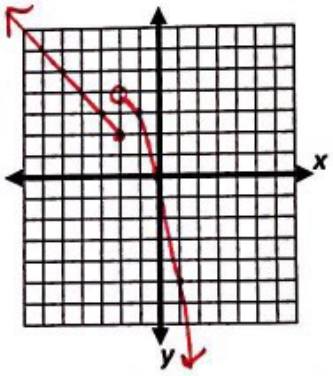


x	$\sqrt{x+2}$
2	2
7	3

3. $h(x)=-\frac{4}{3}|x-1|+4$

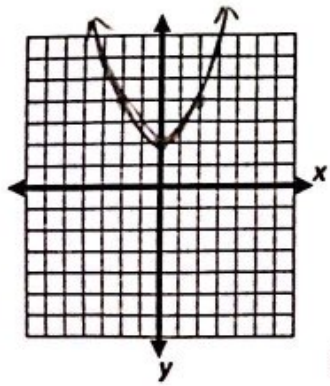


4. $k(x)=\begin{cases}-x, & x\leq -2\\ -x^2-4x, & x>-2\end{cases}$



x	$-x^2-4x$
-2	4
-1	3
0	0

5. Given $f(x) = 2x^2 + 1$ and $g(x) = f\left(\frac{1}{2}x\right)+1$, graph $g(x)$. p. 469 #14

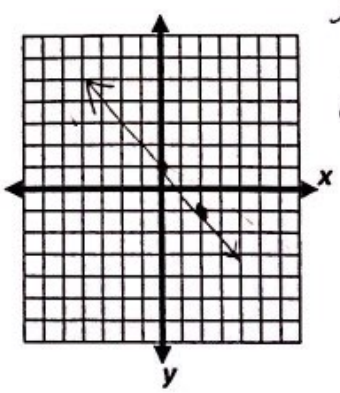


f(x)
x-int: none
y-int: (0,1)
Add'l pts:
(1,3); (-1,3)

g(x): horizontal stretch by 2, vertical shift up 1
y-int. (0,2)
Add'l pts (2,4), (-2,4)

6. Given $f(x) = 2x - 4$ and $g(x) = -\frac{1}{2}f(x)-1$, graph $g(x)$. p. 472 #5

x-int: (2,0)
y-int. (0,-4)



g(x): reflected in x-axis, vertical compression by ½, down 1
add'l pt (2,-1)
y-int: (0,1)

Part II: Problem Solving

7. Given $f(x)=\begin{cases}2x-2, x\le 3\\ -4x+16, x>3\end{cases}$, write the rule for $h(x)$, a vertical translation of $f(x)$ 2 units up.

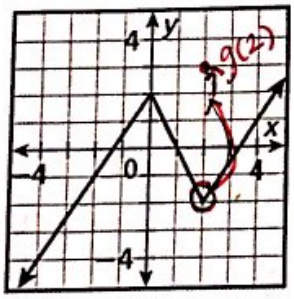
p.469 #12 $h(x)=f(x)+2$ $h(x)=\begin{cases}2x, & x\le 3\\ -4x+18, & x>3\end{cases}$

8. Given $f(x)=\begin{cases}3x+2, x\le 0\\ x^2, x>0\end{cases}$, write the rule for $g(x)$, a horizontal translation of $f(x)$ 7 units right.

p.469 #13 $g(x)=f(x-7)$ $g(x)=\begin{cases}3(x-7)+2, \to 3x-19, x\le 7\\ (x-7)^2, \to x^2-14x+49, x>7\end{cases}$

9. The graph of $f(x)$ is shown below. If $g(x) = -f(x) + 1$, what is $g(2)$?

p.473 #2



$g(x)$: reflection in x-axis and up 1

$g(2)=3$

Given $f(x) = x^2 - 5x - 14$ and $g(x) = x - 7$, find each function. p. 470 #15-20

10. $(f+g)(x) = x^2-4x-21$

11. $(f-g)(x) = x^2-6x-7$

12. $(g-f)(x) = -x^2+6x+7$

13. $(fg)(x) = x^3-12x^2+21x+98$

$(x^2-5x-14)(x-7)$

x^3-5x^2-14x

$-7x^2+35x+98$

14. $\left(\frac{f}{g}\right)(x) = x+2,\ x\neq 7$

$\frac{(x-7)(x+2)}{(x-7)}$

15. $\left(\frac{g}{f}\right)(x) = \frac{1}{x+2},\ x\neq -2, 7$

Let $f(x) = x - 2$ and $g(x) = \frac{8}{x+1}$. p. 470 # 21-24

16. Find $f(g(-2))$ and $g(f(-2))$.

$f(-8) \rightarrow -10$ $\quad$ $g(-4) \rightarrow -8/3$

17. Find $f(g(1))$ and $g(f(1))$.

$f(4) \rightarrow 2$ $\quad$ $g(-1) \rightarrow$ undefined

18. Find $g(f(x))$ and state its domain.

$g(f(x)) = \frac{8}{x-1}, \; x \neq 1$

19. Find $f(g(x))$ and state its domain.

$f(g(x)) = \frac{6-2x}{x+1}, \; x \neq -1$

$\frac{8}{x+1} - 2 = \frac{8}{x+1} - \frac{2(x+1)}{x+1}$

In 20 - 23, find the inverse of each function. Determine whether the inverse is a function, and state its domain and range. p. 470 #27-30

20. $f(x) = 5 - 8x$

Function

$f^{-1}(x) = \frac{x-5}{-8} = \frac{-x+5}{8}$

D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

21. $f(x) = \left(\frac{1}{3}x + 2\right)^2$

Not a function

$y = 3(-2 \pm \sqrt{x})$

$x = \pm 3\sqrt{x} - 6$

D: $[0, \infty)$

R: $(-\infty, \infty)$

22. $f(x) = \frac{5}{2x+8}$

$x = \frac{5}{2y+8}$

$2y + 8 = \frac{5}{x}$

$f^{-1}(x) = \frac{5-8x}{2x}$

D: $(-\infty, 0) \cup (0, \infty)$

R: $(-\infty, -4) \cup (-4, \infty)$

23. $f(x) = 3 + \sqrt{x-5}$

$f^{-1}(x) = (x-3)^2 + 5$

D: $[3, \infty)$

R: $[5, \infty)$

In 24 - 25, determine by composition whether each pair of functions are inverses. p. 471 #31, 32

24. $f(x) = 3x - 5$ and $g(x) = \frac{x-3}{5}$

$f(g(x)) = 3\left(\frac{x-3}{5}\right) - 5 \neq x$

NO

25. $f(x) = \sqrt[3]{x-5}$ and $g(x) = x^3 + 5$

$f(g(x)) = \sqrt[3]{x^3 + 5 - 5} = x$

Yes!

$g(f(x)) = \left(\sqrt[3]{x-5}\right)^3 + 5 = x - 5 + 5 = x$

26. The table shows some values for the function f. What is the value of $f^{-1}(-2)$? p. 473 #6

x	-2	0	2	4
$f(x)$	7	4	1	-2

4

Part III: Applications

27. $f(x) = \begin{cases} 6, & 0 < x \leq 8 \\ 6 + 1.50(x-8), & 8 < x \leq 48 \end{cases}$

OR

$f(x) = \begin{cases} 6, & 0 < x \leq 8 \\ 1.5x - 6, & 8 < x \leq 48 \end{cases}$

28. a) $E(h) = \begin{cases} 9.5h & 0 < h \leq 40 \\ 380 + 13(h-40) & 40 < h \leq 60 \end{cases}$

OR $13h - 140$

b) $E(56.5) = \$594.50$

c) $471 = 13h - 140$

$h = 47$ hours

29. $p(x) = 1.09(x + 30)$

30. $A(r) = 4\pi r^2$

$r(A) = \sqrt{\frac{A}{4\pi}}$ Represents the radius of a sphere with a given surface area.

31. $N(F) = 4F - 160$

a) $F(N) = \frac{N + 160}{4}$ Represents the temperature in °F for a specified # of cricket chirps/minute.

b) $F(60) = 220/4 = 55°F$

c) $N(80°F) = 4(80) - 160 = 160$ chirps/minute