REVIEW CHAPTER 1 AND 2
ADVANCED ALGEBRA 80 **NO CALCULATOR**

Name KEY
Period _____ Date _____

1. Multiply

a) $(6x-7)^2$

$36x^2-84x+49$

b) $(5x-3)(9-2x)$

$45x-27-10x^2+6x$

$-10x^2+51x-27$

2. Factor

a) x^2-49

$(x+7)(x-7)$

b) x^2-5x-6

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

c) $4x^2-9x-9$

$4x^2-12x+3x-9$

$4x(x-3)+3(x-3)$

$(4x+3)(x-3)$

3. Simplify

a) $8\sqrt{72}$

$8\cdot 6\sqrt{2}$

$48\sqrt{2}$

b) $\left(-2\sqrt{6}\right)^2$

$4\cdot 6$

24

c) $5\sqrt{18}-\sqrt{50}+3\sqrt{162}$

$5\cdot 3\sqrt{2}-5\sqrt{2}+3\cdot 9\sqrt{2}$

$10\sqrt{2}+27\sqrt{2}$

$37\sqrt{2}$

4. Solve for x.

a) $y=\dfrac{2x}{5-x}$

$y(5-x)=2x$

$5y-xy=2x$

$5y=2x+xy$

$5y=x(2+y)$

$x=\dfrac{5y}{2+y}$

b) $5x-14=xy+10$

$5x-xy=24$

$x(5-y)=24$

$x=\dfrac{24}{5-y}$

5. Solve each equation within the specified domain.

a) $5-2|4-x|=-17$ **{positive reals}**

$-2|4-x|=-22$

$|4-x|=11$

$4-x=11$ $\quad 4-x=-11$

$-x=7$ $\quad -x=-15$

$x=-7$ $\quad x=15$

$\{15\}$

b) $11-\dfrac{1}{2}x^2=-7$ **{integers}**

$-\frac{1}{2}x^2=-18$

$x^2=36$

$x=\pm 6$

$\{\pm 6\}$

c) $3x^2=10-13x$ **{negative reals}**

$3x^2+13x-10=0$

$3x^2+15x-2x-10=0$

$3x(x+5)-2(x+5)=0$

$(3x-2)(x+5)=0$

$x=\frac{2}{3}$ $\quad x=-5$

$\{-5\}$

d) $9x=3x^2$ **{whole}**

$3x^2-9x=0$

$3x(x-3)=0$

$x=0$ $\quad x=3$

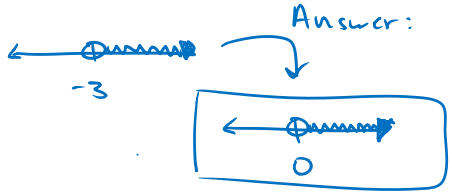
$\{0,3\}$

6. Solve and graph on a number line the solution set for each inequality within the given domain.

a) $5-2x<11$ **{positive reals}**

$-2x<6$

$x>-3$

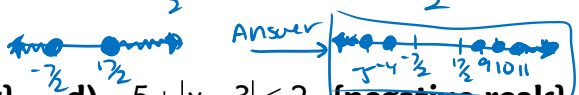


b) $|2x-5|\geq 12$ **{integers}**

$2x-5\geq 12$ or $2x-5\leq -12$

$2x\geq 17$ $\quad 2x\leq -7$

$x\geq 17/2$ $\quad x\leq -7/2$

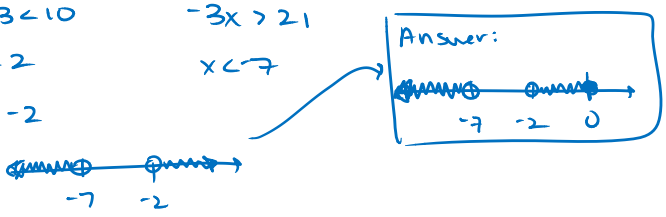


c) $|5-(x-3)|<10$ or $-5-3x>16$ **{non-positive reals}**

$5-x+3<10$ $\quad -3x>21$

$-x<2$ $\quad x<-7$

$x>-2$

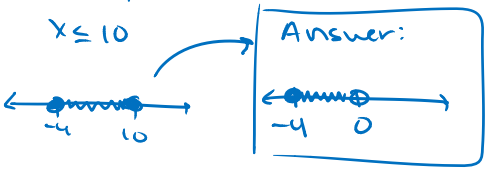


d) $-5+|x-3|\leq 2$ **{negative reals}**

$|x-3|\leq 7$ and $x-3\geq -7$

$x-3\leq 7$ $\quad x\geq -4$

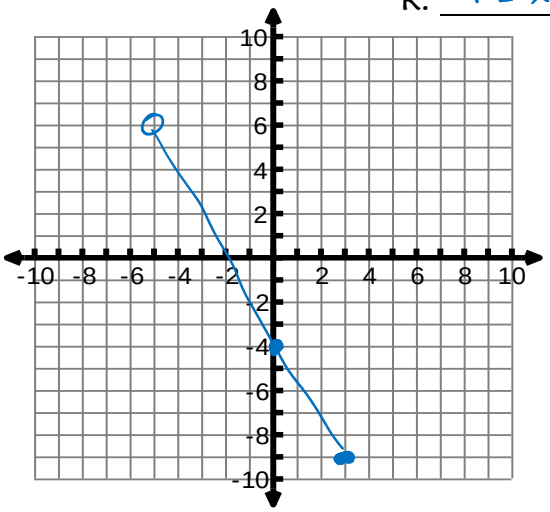
$x\leq 10$



For 7-10, graph each function, given the domain, and state the appropriate range. Plot at least 3 points for each graph.

7. $y=\frac{-5}{3}x-4$ D: $\{-6<x\leq 3\}$

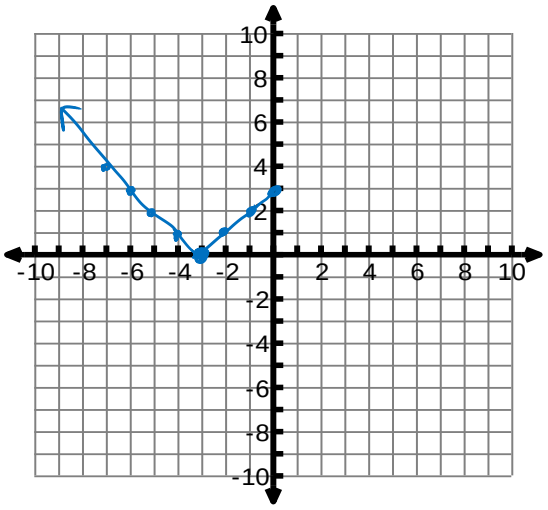
R: $-9\leq x<6$



x	y
-6	6
0	-4
3	-9

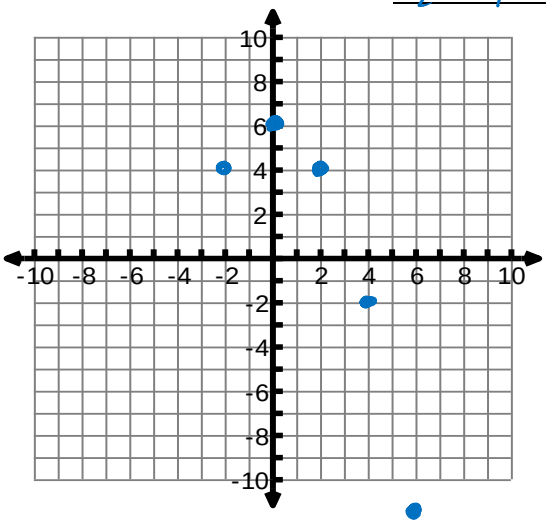
8. $y=|x+3|$ D: {non-positive reals}

R: $y\geq 0$



9. $y=\frac{-1}{2}x^2+6$ D: {-2, 0, 2, 4, 6}

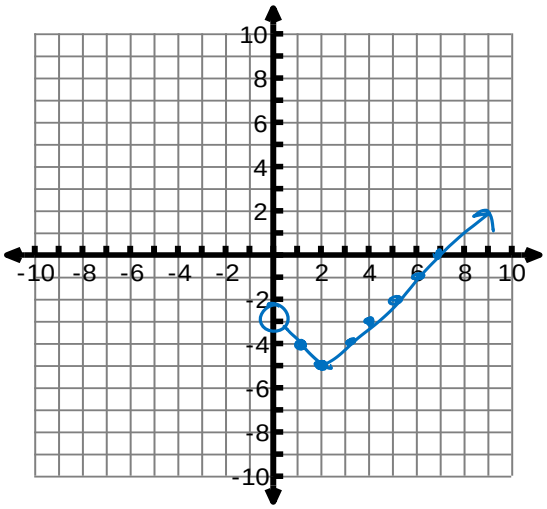
R: $\{-12, -2, 4, 6\}$



x	y
-2	4
0	6
2	4
4	-2
6	-12

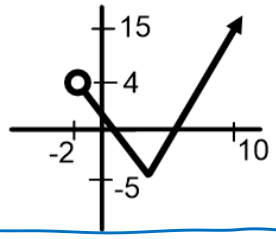
10. $y=|x-2|-5$ D: {positive reals}

R: $y\geq -5$



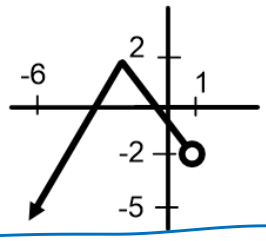
11. Identify the domain and range of the following graphs.

a)



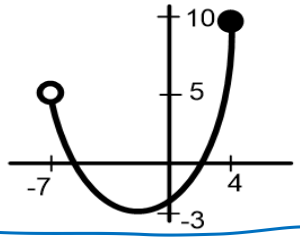
D: $x > -2$ R: $y \geq -5$

b)



D: $x < 1$ R: $y \leq 2$

c)



D: $-7 < x \leq 4$ R: $-3 \leq y \leq 10$

12. Describe what is happening to the absolute value graph based on the parent function $y = |x|$.

Note: there are four aspects of the absolute value graph to discuss.

a) $y = \frac{4}{3}|x+5|-1$

a) vertical stretch
opens up
shifted left 5
shifted down 1

b) $y - 8 = -\frac{1}{2}|x-7|$

b) vertical shrink
opens down
shifted right 7
shifted up 8

13. Find the equation of the absolute value function on the right. Show work!

vertex: $(-3,-2)$

$y = a|x+3|-2$ plug in $(-2,0)$

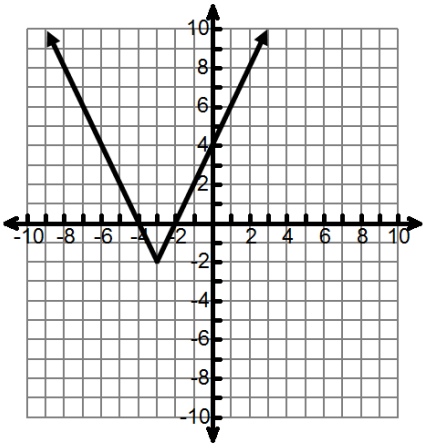
$0 = a|-2+3|-2$

$0 = a|1|-2$

$0 = a-2$

$a = 2$

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

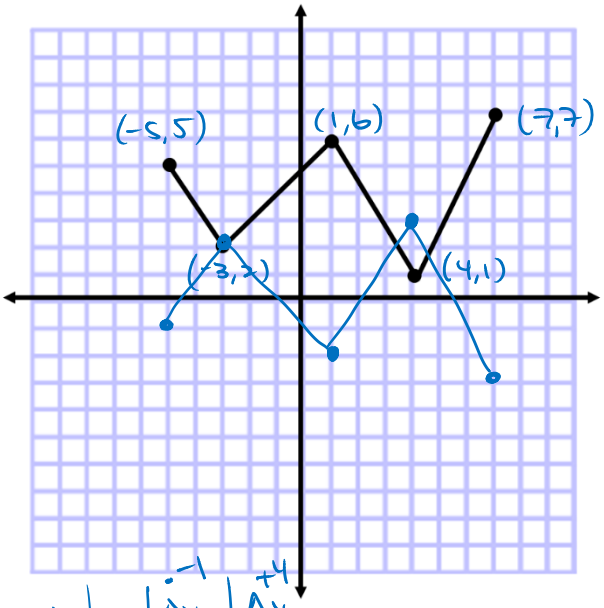


14. Write an equation of an absolute value graph that has been translated three units to the right, six units down, opens down, and is skinnier/stretched vertically than the parent function of $y = |x|$.

Ex: $y = -3|x-3|-6$

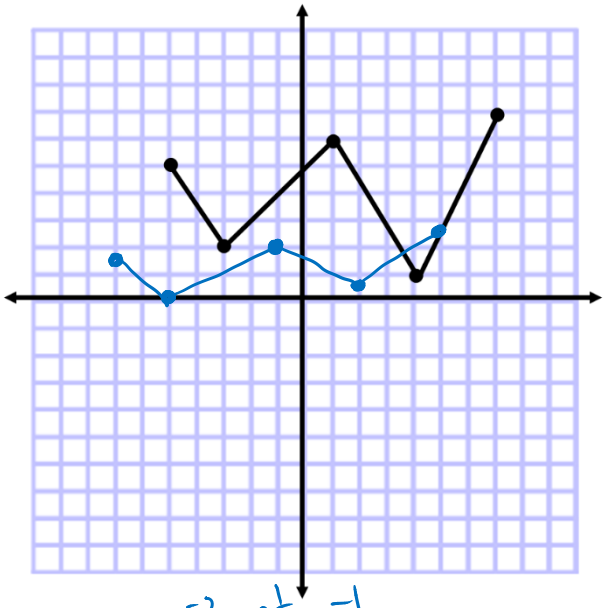
a is any # > 1

15. Given the function w(x), graph –w(x) + 4



x	y	Δy_1 (·−1)	Δy_2 (+4)
-5	5	-5	-1
-3	2	-2	2
1	6	-6	-2
4	1	-1	3
7	7	-7	-3

16. Given the function w(x), graph $\frac{1}{2}w(x+2)-1$



x	y	Δx (−2)	Δy_1 (·½)	Δy_2 (−1)
-5	5	-7	5/2	3/2
-3	2	-5	1	0
1	6	-1	3	2
4	1	2	1/2	-1/2
7	7	5	7/2	5/2