Main Ideas/Questions	Notes	Section 1.6
WARM-UP	**1.** If $\|x\| = 7$ what are the possible values of x? 7, -7	**2.** If $\|x\| = -4$, what are the possible values of x? none

Steps to Solve Absolute Value Equations		
	1	Isolate the absolute value
	2	Create 2 cases (drop the bars) one pos one neg
	3	solve each equation
	4	check solutions
What are Extraneous solutions?	Solutions that do not satisfy the original equation	

Directions: Solve each equation. Be sure to check for extraneous solutions.

3. $|x-9|=5$

$x-9=5$ $\quad x-9=-5$

$x=14$ $\quad x=4$

$|14-9|=5$ ✓ $\quad |4-9|=5$ ✓

4. $3=|2k+7|$

$3=2k+7$ $\quad -3=2k+7$

$-4=2k$ $\quad -10=2k$

$-2=k$ $\quad -5=k$

$3=|2(-2)+7|$ ✓ $\quad 3=|2(-5)+7|$ ✓

5. $\frac{16|r-5|}{16}=\frac{-32}{16}$

$|r-5|=-2$

no solution

*an abs. value cannot = neg numb.

6. $\frac{|3a+12|}{9}=0$

$|3a+12|=0$

no 2 cases since 0 isn't positive nor negative

$3a+12=0$

$3a=-12$

$a=-4$

$\frac{|3(-4)+12|}{9}=0$ ✓

7. $|3x-9|=x+1$

$3x-9=x+1$ $\quad 3x-9=-(x+1)$

$2x=10$ $\quad 3x-9=-x-1$

$x=5$ $\quad 4x=8$

$x=2$

$|3(5)-9|=5+1$ ✓ $\quad |3(2)-9|=2+1$ ✓

8. $|8-2n|-5n=n+2$

$|8-2n|=6n+2$

$8-2n=6n+2$ $\quad 8-2n=-(6n+2)$

$6=8n$ $\quad 8-2n=-6n-2$

$\frac{6}{8}=n$ $\quad 4n=-10$

$\frac{3}{4}=n$ $\quad n=-5/2$ ← Extr.

$|8-2(-5/2)|-5(-5/2)=\frac{-5}{2}+2$

$\frac{28}{2}+\frac{25}{2}=-\frac{1}{2}$

X

$|8-2(3/4)|-5(3/4)=3/4+2$

$\frac{28}{4}-\frac{15}{4}=\frac{11}{4}$ ✓

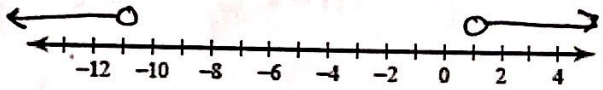
Main Ideas/Questions	Notes	Section 1.6
Steps to Solve Absolute Value Inequalities	1	Isolate the absolute value
	2	double switch into 2 cases (KISS Keep it, switch ineq, switch sign)
	3	solve each inequality
	4	graph on a number line

Directions: Solve and graph each solution.

9. $|x+6|>7$

$x+6>7$ $\quad x+6<-7$

$x>1$ $\quad x<-13$

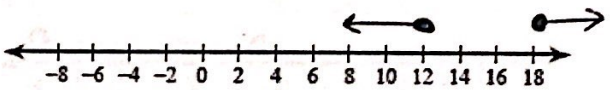


10. $|-5+\frac{k}{3}|\geq 1$

$-5+\frac{k}{3}\geq 1$ $\quad -5+\frac{k}{3}\leq -1$

$\frac{k}{3}\geq 6$ $\quad \frac{k}{3}\leq 4$

$k\geq 18$ $\quad k\leq 12$

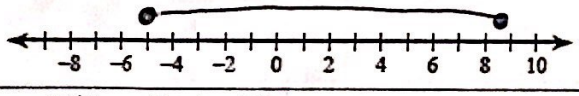


11. $|7-4n|\leq 27$

$7-4n\leq 27$ $\quad 7-4n\geq -27$

$-4n\leq 20$ $\quad -4n\geq -34$

$n\geq -5$ $\quad n\leq 17/2$ (8.5)

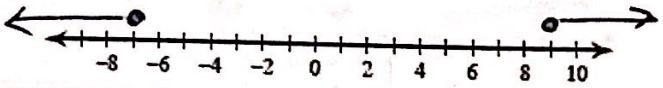


12. $\frac{|x-1|}{4}\geq 2$

$|x-1|\geq 8$

$x-1\geq 8$ $\quad x-1\leq -8$

$x\geq 9$ $\quad x\leq -7$



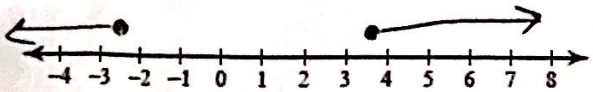
13. $-10|2r-1|\leq -60$

$|2r-1|\geq 6$

$2r-1\geq 6$ $\quad 2r-1\leq -6$

$2r\geq 7$ $\quad 2r\leq -5$

$r\geq 7/2$ $\quad r\leq -5/2$



14. $-1-4|x+9|<-21$

$-4|x+9|<-20$

$|x+9|>5$

$x+9>5$ $\quad x+9<-5$

$x>-4$ $\quad x<-16$