PRACTICE L9 Absolute Value Equations Name: KEY HR: ____

Solve and the following absolute value equations.

1. Find the distance between -5 and -38.

Distance = $|a-b|$

$|-38--5|$ or $|-5--38|$

$|-38+5|$ $|-5+38|$

$|-33|$ $|33|$

33 33

2. Find the distance between 12 and 47.

$d = |12-47|$

$= |-35|$

$= 35$

3. Find the distance between -20 and 35.

$d = |-20-35|$

$= |-55| = 55$

4. Find the distance between 150 and 375.

$d = |375-150|$

$= 225$

5. Find the distance between -245 and -789.

$d = |-789--245|$

$= |-789+245$

$= |-544| = 544$

6. Find the distance between 3.5 and -14.2.

$d = |-14.2-3.5|$

$= |-17.7|$

$= 17.7$

7. $|x| = 7$

$x = 7$ or $x = -7$

8. $|x-3| = 5$

Case 1

$x-3 = 5$

$x = 8$

Case 2

$x-3 = -5$

$+3 \quad +3$

$x = -2$

9. $|2x+1| = 9$

C1: $2x+1 = 9$

$2x = 8$

$x = 4$

C2: $2x+1 = -9$

$-1 \quad -1$

$2x = -10$

$x = -5$

10. $4|x-2| = 20$

$\frac{4}{4} \quad \frac{4}{4}$

$|x-2| = 5$

$x-2 = 5$

$x = 7$

$x-2 = -5$

$x = -3$

11. $|x+6|=0$

C1: $x+6=0$, $x=-6$

C2: $x+6=-0$, $x=-6$

$x=-6$

12. $3|x-4|+2=14$

$-2 \quad -2$

$\frac{3|x-4|}{3} = \frac{12}{3}$

$|x-4|=4$

$x-4=4$ → $x=8$

$x-4=-4$ → $x=0$

13. $|5x|=25$

$\frac{5x}{5} = \frac{25}{5}$ → $x=5$

$\frac{5x}{5} = \frac{-25}{5}$ → $x=-5$

14. $2|x+1|-3=7$

$+3 \quad +3$

$2|x+1|=10$

$|x+1|=5$

C1: $x+1=5$, $-1 \quad -1$, $x=4$

C2: $x+1=-5$, $-1 \quad -1$, $x=-6$

15. $|x-8|=-2$

No Solutions

16. $-4|x+3|=12$

$\frac{-4}{-4} \quad \frac{12}{-4}$

$|x+3|=-3$

ABS. Val = Negative → No Solutions

17. $|3x-5|+4=10$

$|3x-5|=6$

$3x-5=6$

$3x=11$

$x=11/3$

$3x-5=-6$

$+5 \quad +5$

$3x=-1$

$x=\frac{-1}{3}$

18. $|x|=-6$

No Solutions