

Advanced Algebra Review
Assignment # _____

Name _____

Key

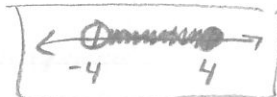
Solve each inequality.

1. $-10 < 3x + 2 \leq 14$

$\begin{array}{ccc} -2 & -2 & -2 \\ \hline -12 & < 3x & \leq 12 \end{array}$

$\begin{array}{ccc} -12 & < 3x & \leq 12 \\ \hline -4 & < x & \leq 4 \end{array}$

$-4 < x \leq 4$

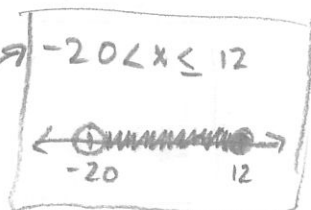


2. $-5 \leq 1 - \frac{1}{2}x < 11$

$\begin{array}{ccc} -1 & -1 & -1 \\ \hline -6 & \leq -\frac{1}{2}x & < 10 \end{array}$

$\begin{array}{ccc} -6 & \leq -\frac{1}{2}x & < 10 \\ \hline x-2 & x-2 & x-2 \end{array}$

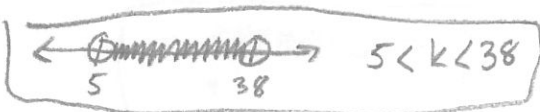
$12 \geq x > -20$



(Draw a graph to determine each solution. Write the simplest solution.)

3. $2k > 10$ and $k - 8 < 30$

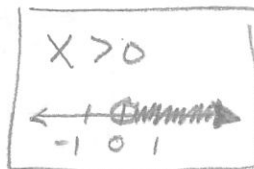
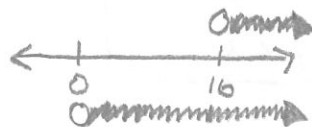
$k > 5$ and $k < 38$



4. $\frac{3}{4}x - 2 > 10$ or $3x > 0$

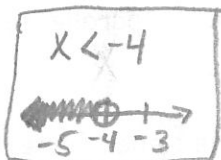
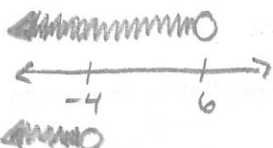
$\frac{3}{4}x > 12$ or $x > 0$

$x > 16$



5. $5x < -20$ and $\frac{1}{2}x < 3$

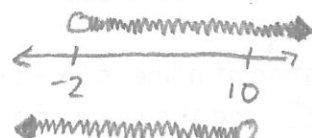
$x < -4$ and $x < 6$



6. $2 - 3a < 8$ or $a < 10$

$-3a < 6$

$a > -2$ or $a < 10$



All Real Solutions

Solve the absolute value equations. (Remember: TWO equations are needed. See pp. 33-34 examples 1-3)

7. $|2x - 3| = 17$

$2x - 3 = 17$

$2x - 3 = -17$

$2x = 20$

$2x = -14$

$x = 10$

$x = -7$

8. $|3x - 1| + 10 = 25$

$|3x - 1| = 15$

$3x - 1 = 15$

$3x = 16$

$x = \frac{16}{3}$

$3x - 1 = -15$

$3x = -14$

$x = -\frac{14}{3}$

9. $-2|x + 1| = 10$

$|x + 1| = -5$

No solution

10. $3|4w - 1| - 5 = 10$

$3|4w - 1| = 15$

$|4w - 1| = 5$

$4w - 1 = 5$

$4w = 6$

$w = 1.5$

$4w - 1 = -5$

$4w = -4$

$w = -1$

Solve the absolute value inequalities. (Remember: Use a graph to determine the solution.)

11. $|5x| > 20$

$5x = 20 \quad x = 4$ $5x = -20 \quad x = -4$

I II III

$x < -4$ or $x > 4$

I $|5(-5)| > 20$
 $25 > 20$ T

II $|5(0)| > 20$
 $0 > 20$ F

III $|5(5)| > 20$
 $25 > 20$ T

12. $|x - 2| > -4$

always true

$x - 2 = -4 \quad x = -2$ $x - 2 = 4 \quad x = 6$

I II III

\mathbb{R}

I $|-3 - 2| > -4$
 $5 > -4$ T

II $|0 - 2| > -4$
 $2 > -4$ T

III $|7 - 2| > -4$
 $5 > -4$ T

13. $|y + 5| < 8$

$y + 5 = 8 \quad y = 3$ $y + 5 = -8 \quad y = -13$

I II III

$-13 < y < 3$

I $|-14 + 5| < 8$
 $9 < 8$ F

II $|0 + 5| < 8$
 $5 < 8$ T

III $|4 + 5| < 8$
 $9 < 8$ F

14. $|3 - \frac{1}{2}x| < 9$

$3 - \frac{1}{2}x = 9 \quad x = -12$ $3 - \frac{1}{2}x = -9 \quad x = 24$

I II III

$-12 < x < 24$

I $|3 - \frac{1}{2}(-12)| < 9$
 $9 < 9$ F

II $|3 - \frac{1}{2}(0)| < 9$
 $3 < 9$ T

III $|3 - \frac{1}{2}(24)| < 9$
 $9 < 9$ F

Solve.

15. If the slope of a line is 5, then the slope of the line parallel to it is 5 and the slope of the line perpendicular to it is $-1/5$.

16. If the equation of a line is $2x - 5y = 10$, then the slope of the line parallel to the given line is $2/5$ and the slope of a line perpendicular to the given line is $-5/2$.

$2x - 5y = 10$ $y = \frac{2}{5}x - 2$
 $-5y = -2x + 10$

17. The general form of an absolute value function is $y = a|x - h| + k$.
The general form of the vertex of an absolute value function is (h, k) .
The equation of the axis of symmetry for an absolute value function is $x = h$.

18. The vertex of $y = 3|x + 6| - 8$ is $(-6, -8)$.

The equation for the axis of symmetry is $x = -6$.

19. Make a T-chart and graph:
 $y = |x - 4| + 2$

x	y
2	4
3	3
4	2
5	3
6	4

