

Advanced Algebra – Section 1-5
Absolute Value Inequalities

Name _____ hr _____

From Practice WS 1-5 (#4-12): Solve each inequality. Graph the solutions.

4. $|x + 5| > 12$

5. $|k - 3| \leq 19$

6. $|x + 2| \geq 0$

7. $2|t - 5| < 14$

8. $|3x - 2| + 7 \geq 11$

9. $5|2b + 1| - 3 \leq 7$

10. $|2 - 3w| \geq 4$

11. $-3|7m - 8| < 5$

12. $|2u| > 6$

From pg 36 (17-27 odd, 44-52 even): Solve each inequality. Graph the solutions.

17. $|x - 5| \geq 8$

19. $|2x + 1| \geq -9$

21. $|3z| - 4 > 8$

23. $|6y - 2| + 4 < 22$

25. $\frac{1}{4}|x - 3| + 2 < 1$

27. $3|5t - 1| + 9 \leq 23$

44. $|3x - 4| + 5 \leq 27$

46. $-2|x + 4| < 22$

48. $|3z + 15| \geq 0$

50. $\frac{1}{9}|5x - 3| - 3 \geq 2$

52. $\left|\frac{x-3}{2}\right| + 2 < 6$

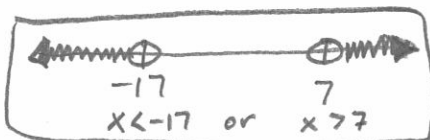
Advanced Algebra – Section 1-5
Absolute Value Inequalities

Name Key hr _____

From Practice WS 1-5 (#4-12): Solve each inequality. Graph the solutions.

4. $|x + 5| > 12$

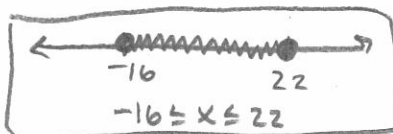
$$\begin{aligned} x + 5 &= 12 & x + 5 &= -12 \\ x &= 7 & x &= -17 \end{aligned}$$



- I $|-18 + 5| > 12$ $13 > 12$ T
II $|0 + 5| > 12$ $5 > 12$ F
III $|8 + 5| > 12$ $13 > 12$ T

5. $|k - 3| \leq 19$

$$\begin{aligned} k - 3 &= 19 & k - 3 &= -19 \\ k &= 22 & k &= -16 \end{aligned}$$



- I $|-17 - 3| \leq 19$ $20 \leq 19$ F
II $|0 - 3| \leq 19$ $3 \leq 19$ T
III $|23 - 3| \leq 19$ $20 \leq 19$ F

6. $|x + 2| \geq 0$

$$\begin{aligned} x + 2 &= 0 \\ x &= -2 \end{aligned}$$

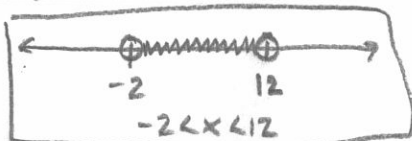


- I $|-3 + 2| \geq 0$ $1 \geq 0$ T
II $|-1 + 2| \geq 0$ $1 \geq 0$ T

7. $2|t - 5| < 14$

$$|t - 5| < 7$$

$$\begin{aligned} t - 5 &= 7 & t - 5 &= -7 \\ t &= 12 & t &= -2 \end{aligned}$$

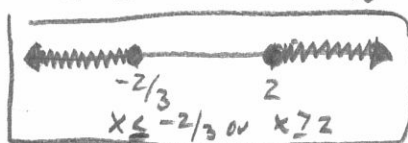


- I $2|-3 - 5| < 14$ $16 < 14$ F
II $2|0 - 5| < 14$ $10 < 14$ T
III $2|13 - 5| < 14$ $16 < 14$ F

8. $|3x - 2| + 7 \geq 11$

$$|3x - 2| \geq 4$$

$$\begin{aligned} 3x - 2 &= 4 & 3x - 2 &= -4 \\ 3x &= 6 & 3x &= -2 \\ x &= 2 & x &= -2/3 \end{aligned}$$



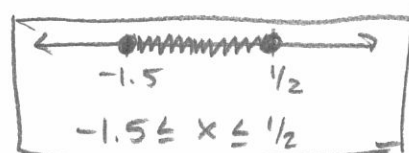
- I $|3|-2| + 7 \geq 11$ $12 \geq 11$ T
II $|3 \cdot 0 - 2| + 7 \geq 11$ $9 \geq 11$ F
III $|3 \cdot 3 - 2| + 7 \geq 11$ $14 \geq 11$ T

9. $5|2b + 1| - 3 \leq 7$

$$5|2b + 1| \leq 10$$

$$|2b + 1| \leq 2$$

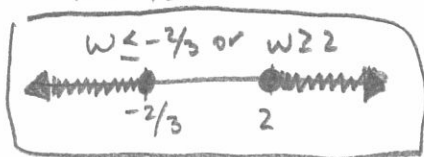
$$\begin{aligned} 2b + 1 &= 2 & 2b + 1 &= -2 \\ 2b &= 1 & 2b &= -3 \\ b &= 1/2 & b &= -1.5 \end{aligned}$$



- I $5|2 \cdot -2 + 1| - 3 \leq 7$ $12 \leq 7$ F
II $5|2 \cdot 0 + 1| - 3 \leq 7$ $2 \leq 7$ T
III $5|2 \cdot 1 + 1| - 3 \leq 7$ $12 \leq 7$ F

10. $|2 - 3w| \geq 4$

$$\begin{aligned} 2 - 3w &= 4 & 2 - 3w &= -4 \\ -3w &= 2 & -3w &= -6 \\ w &= -2/3 & w &= 2 \end{aligned}$$



- I $|2 - 3 \cdot -1| \geq 4$ $5 \geq 4$ T
II $|2 - 3 \cdot 0| \geq 4$ $2 \geq 4$ F
III $|2 - 3 \cdot 3| \geq 4$ $7 \geq 4$ T

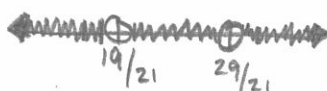
11. $-3|7m - 8| < 5$

$$|7m - 8| > -5/3$$

TR

always true

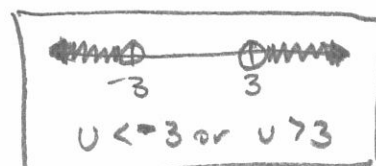
$$\begin{aligned} 7m - 8 &= -5/3 & 7m - 8 &= 5/3 \\ 7m &= 6 1/3 & 7m &= 9 2/3 \\ m &= 19/21 & m &= 29/21 \end{aligned}$$



- I $-3|7 \cdot 0 - 8| < 5$ $-24 < 5$ T
II $-3|7 \cdot 1 - 8| < 5$ $-3 < 5$ T
III $-3|7 \cdot 2 - 8| < 5$ $-18 < 5$ T

12. $|2u| > 6$

$$\begin{aligned} 2u &= 6 & 2u &= -6 \\ u &= 3 & u &= -3 \end{aligned}$$

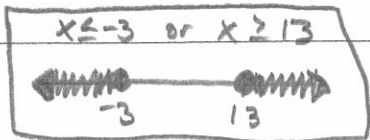


- I $|2 \cdot -4| > 6$ $8 > 6$ T
II $|2 \cdot 0| > 6$ $0 > 6$ F
III $|2 \cdot 4| > 6$ $8 > 6$ T

From pg 36 (17-27 odd, 44-52 even): Solve each inequality. Graph the solutions.

17. $|x - 5| \geq 8$

$$\begin{aligned} x - 5 &= 8 & x - 5 &= -8 \\ x &= 13 & x &= -3 \end{aligned}$$

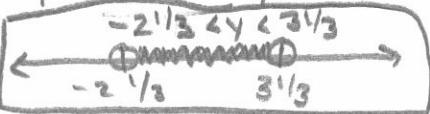


I $| -4 - 5 | \geq 8$ $9 \geq 8$ T
 II $| 10 - 5 | \geq 8$ $5 \geq 8$ F
 III $| 14 - 5 | \geq 8$ $9 \geq 8$ T

23. $|6y - 2| + 4 < 22$

$$|6y - 2| < 18$$

$$\begin{aligned} 6y - 2 &= 18 & 6y - 2 &= -18 \\ y &= 3\frac{1}{3} & y &= -2\frac{1}{3} \end{aligned}$$

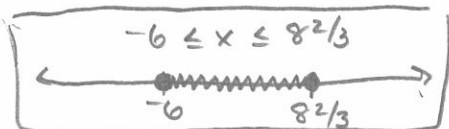


I $|6 \cdot 3 - 2| + 4 < 22$ $24 < 22$ F
 II $|6 \cdot 0 - 2| + 4 < 22$ $6 < 22$ T
 III $|6 \cdot 4 - 2| + 4 < 22$ $26 < 22$ F

44. $|3x - 4| + 5 \leq 27$

$$|3x - 4| \leq 22$$

$$\begin{aligned} 3x - 4 &= 22 & 3x - 4 &= -22 \\ x &= 8\frac{2}{3} & x &= -6 \end{aligned}$$

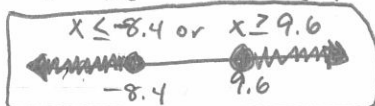


I $|3 \cdot 7 - 4| + 5 \leq 27$ $30 \leq 27$ F
 II $|3 \cdot 0 - 4| + 5 \leq 27$ $9 \leq 27$ T
 III $|3 \cdot 9 - 4| + 5 \leq 27$ $28 \leq 27$ F

50. $\frac{1}{9}|5x - 3| - 3 \geq 2$

$$\begin{aligned} \frac{1}{9}|5x - 3| &\geq 5 \\ |5x - 3| &\geq 45 \end{aligned}$$

$$\begin{aligned} 5x - 3 &= 45 & 5x - 3 &= -45 \\ x &= 9.6 & x &= -8.4 \end{aligned}$$



I $\frac{1}{9}|5 \cdot 9 - 3| - 3 \geq 2$ $2\frac{1}{3} \geq 2$ T
 II $\frac{1}{9}|5 \cdot 0 - 3| - 3 \geq 2$ $-2\frac{2}{3} \geq 2$ F
 III $\frac{1}{9}|5 \cdot 10 - 3| - 3 \geq 2$ $2\frac{2}{9} \geq 2$ T

19. $|2x + 1| \geq -9$

$$\begin{aligned} 2x + 1 &= -9 & 2x + 1 &= 9 \\ x &= -5 & x &= 4 \end{aligned}$$



I $|2 \cdot -6 + 1| \geq -9$ $11 \geq -9$ T
 II $|2 \cdot 0 + 1| \geq -9$ $1 \geq -9$ T
 III $|2 \cdot 5 + 1| \geq -9$ $11 \geq -9$ T

25. $\frac{1}{4}|x - 3| + 2 < 1$

$$\begin{aligned} \frac{1}{4}|x - 3| &< -1 \\ |x - 3| &< -4 \end{aligned}$$

$$\begin{aligned} x - 3 &= -4 & x - 3 &= 4 \\ x &= -1 & x &= 7 \end{aligned}$$



I $\frac{1}{4}|-2 - 3| + 2 < 1$ $3.25 < 1$ F
 II $\frac{1}{4}|0 - 3| + 2 < 1$ $2.75 < 1$ F
 III $\frac{1}{4}|8 - 3| + 2 < 1$ $3.25 < 1$ F

46. $-2|x + 4| < 22$

$$|x + 4| > -11$$

$$\begin{aligned} x + 4 &= -11 & x + 4 &= 11 \\ x &= -15 & x &= 7 \end{aligned}$$

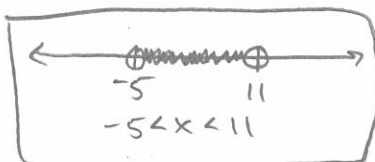


I $-2|-16 + 4| < 22$ $-24 < 22$ F
 II $-2|0 + 4| < 22$ $-8 < 22$ F
 III $-2|8 + 4| < 22$ $-24 < 22$ F

52. $\left| \frac{x-3}{2} \right| + 2 < 6$

$$\left| \frac{x-3}{2} \right| < 4$$

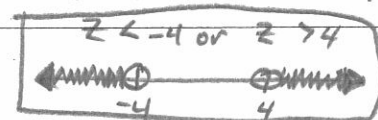
$$\begin{aligned} \frac{x-3}{2} &= 4 & \frac{x-3}{2} &= -4 \\ x &= 11 & x &= -5 \end{aligned}$$



21. $|3z| - 4 > 8$

$$|3z| > 12$$

$$\begin{aligned} 3z &= 12 & 3z &= -12 \\ z &= 4 & z &= -4 \end{aligned}$$



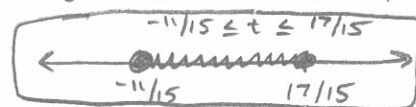
I $|3 \cdot -5| - 4 > 8$ $11 > 8$ T
 II $|3 \cdot 0| - 4 > 8$ $-4 > 8$ F
 III $|3 \cdot 5| - 4 > 8$ $11 > 8$ T

27. $3|5t - 1| + 9 \leq 23$

$$3|5t - 1| \leq 14$$

$$|5t - 1| \leq 4\frac{2}{3}$$

$$\begin{aligned} 5t - 1 &= 4\frac{2}{3} & 5t - 1 &= -4\frac{2}{3} \\ t &= 1\frac{7}{15} & t &= -\frac{11}{15} \end{aligned}$$



I $3|5 \cdot -1 - 1| + 9 \leq 23$ $27 \leq 23$ F
 II $3|5 \cdot 0 - 1| + 9 \leq 23$ $12 \leq 23$ T
 III $3|5 \cdot 2 - 1| + 9 \leq 23$ $36 \leq 23$ F

48. $|3z + 15| \geq 0$

$$\begin{aligned} 3z + 15 &= 0 \\ z &= -5 \end{aligned}$$



I $|3 \cdot -6 + 15| \geq 0$ $3 \geq 0$ T
 II $|3 \cdot -4 + 15| \geq 0$ $3 \geq 0$ T