

Solving and Graphing Absolute Value Inequalities (ALG.ABS.02)

Solve and graph each inequality.

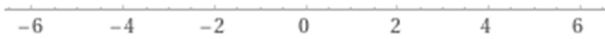
1. $|x| < 6$ $-6 < x < 6$



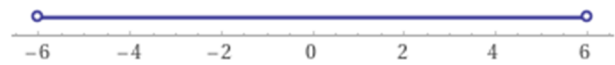
2. $|k| \geq 2$ $k \leq -2$ OR $k \geq 2$



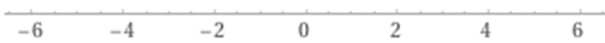
3. $-3 > |y - 2|$ **No Solution**



4. $-5|m| > -30$ $-6 < m < 6$



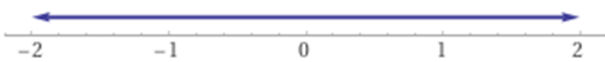
5. $|a| + 3 \leq 2$ **No Solution**



6. $|-2x| \geq 4$ $x \leq -2$ OR $x \geq 2$



7. $3\left|\frac{n}{-2}\right| > -6$ **All Real Numbers**



8. $2 - 2|d - 7| > 0$ $6 < d < 8$



9. $-7|p| - 4 \leq -67$ $p \leq -9$ OR $p \geq 9$



10. $|3n - 5| < 10$ $-\frac{5}{3} < n < 5$



11. $\frac{4}{7}|p - 3| \geq 8$ $p \leq -11$ OR $p \geq 17$



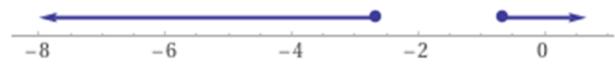
12. $\frac{|2t+3|}{-5} \leq -3$ $t \leq -9$ OR $t \geq 6$



13. $8 - 3|7 - x| > 11$ **No Solution**



14. $5|3n + 5| + 7 \geq 22$ $n \leq -\frac{8}{3}$ OR $n \geq -\frac{2}{3}$



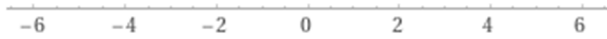
15. $2|-y - 7| + 2 > 12$ $y < -12$ OR $y > -2$



16. $|10c - 4| + 3 \leq 57$ $-5 \leq c \leq \frac{29}{5}$



17. $-5 + |4 - 3x| < -25$ **No Solution**



18. $\frac{11}{9} \left| 1 - \frac{p}{7} \right| + \frac{1}{3} > \frac{23}{14}$ **$p < -\frac{1}{2}$ OR $p > \frac{29}{2}$**



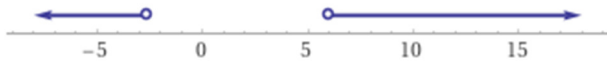
19. $-\frac{4}{3} \left| 3x - \frac{1}{2} \right| - 2 > -\frac{40}{3}$ **$-\frac{8}{3} < x < 3$**



20. $\frac{1}{5} \left| \frac{3}{8}x - \frac{3}{2} \right| - \frac{3}{2} < -\frac{9}{8}$ **$-1 < x < 9$**



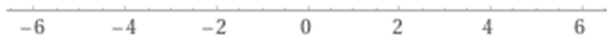
21. $|2c + 1| > |c + 7|$ **$x < -\frac{8}{3}$ OR $x > 6$**



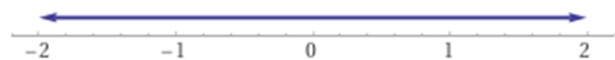
22. $3|x - 4| + 2 < |x|$ **$\frac{7}{2} < x < 5$**



23. $\frac{1}{2}|y + 3| \geq |y - 1| + 5$ **No Solution**



24. $2 - |3k - 1| \leq |k| + 3$ **All Real Numbers**



25. Write an absolute value inequality whose solution is all real numbers. **Answers will vary.**

26. Write an absolute value inequality with no solution. **Answers will vary.**

27. Write an absolute value inequality whose solution set is $(-\infty, -3) \cup (9, +\infty)$.

Answers will vary. Example, $|x - 3| > 6$.

28. Write an absolute value inequality whose solution set is $\left[-\frac{9}{2}, \frac{3}{4}\right]$.

Answers will vary. Example, $|8x + 15| \leq 21$.

29. Joanne must write an essay for her college application. The essay requirement is 500 words with an absolute deviation of at most 100 words. Write an absolute value inequality to represent the acceptable lengths of her college application essay. **$|w - 500| \leq 100$**

30. A street in a certain city must be built to a standard width of 34 feet with a tolerance of 0.5 feet. Streets that are not within this tolerance must be repaired. Write an absolute value inequality that represents that acceptable width of a street in the city. **$|w - 34| \leq 0.5$**

31. The acceptable tolerance of a machine part is 1 foot $\pm \frac{3}{64}$ inches. Write the tolerance as an absolute value inequality in feet. $|d - 1| \leq \frac{1}{256}$

32. A thermometer measures ten body temperatures accurately within $\pm 0.15^\circ\text{F}$. Which of the following is an expression for the actual temperature t of a person if this thermometer measures the person's temperature as 98.5°F ? **A**

- a. $|t - 98.5| \leq 0.15$ b. $|t + 98.5| \leq 0.15$ c. $|t - 98.5| \geq 0.15$ d. $|t + 98.5| \geq 0.15$