

Solving Inequalities Review Guide

Check whether the given number is a solution of the inequality.

1. $2a - 9 \geq 13$ $x = 11$ 2. $7 + 7x \geq 20$ $x = 2$

Write and solve each inequality.

- 7 is greater than 21 times y .
- The ratio of x and 4 is less than or equal to 17.
- The ratio of 14 and y is less than 21.
- A number x increased by 5 is less than or equal to 33.
- A quarter of a number is greater than or equal to 38.
- The product of negative three and a number is greater than ten or less than one.
- In a beverage company, the machine is designed to fill a 1.5 liter bottle of soda between 1.48 liter and 1.53 liter. Write the compound inequality that describes the volume of soda the machine must dispense in a 1.5 liter bottle of soda.
- After buying a burger costing \$5, Roy has no more than \$23 in his pocket. How much money did Roy have before buying the burger?
- The area of a rectangle is less than 85 square feet. The length of the rectangle is 20 feet. What is the width of the rectangle?

Solve each inequality.

- | | |
|----------------------|----------------------|
| 12. $x - 12 \geq -1$ | 13. $a - 3 \geq -2$ |
| 14. $-2 + y < 5$ | 15. $5 + a \geq -5$ |
| 16. $-3 \leq y + 2$ | 17. $3a \leq 2a - 5$ |
| 18. $2y > -7 + y$ | 19. $-0.7a > 4.9$ |

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20. $\frac{x}{7} \leq -8$

21. $-\frac{x}{4} < 13$

22. $5 - 3a \leq 26$

23. $-5 - \frac{8y}{9} > 59$

24. $2x + 4 \leq 3(2x - 5)$

25. $8 + 4x \leq 3(2x + 4) - 2(-4 - 2x)$

26. $|x + 14| > 52$

27. $|10 - 3x| \leq 2$

Write, solve and graph each inequality.

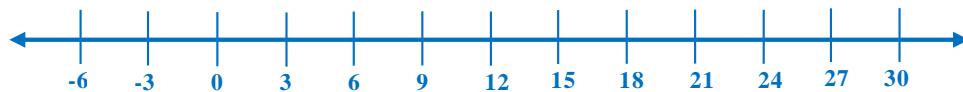
28. $x > -2$



29. Five times a number minus fifteen is less than ninety.



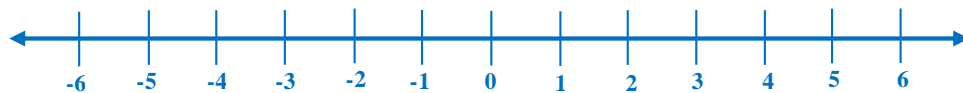
30. $12 < x \leq 27$



31. $x \leq 4$ and $x \geq -9$



32. $3x + 13 \leq 5 + x \leq 3x - 7$

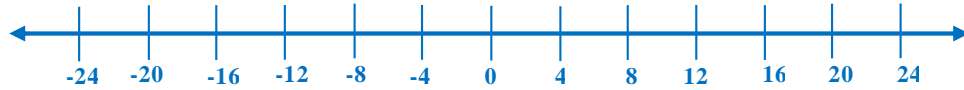


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33. $|2 - 3x| < -7$



34. $|x + 3| - 6 > 10$



Solve each equation.

35. $|x + 1| = 7$

36. $|5x + 2| = 27$

Write each set in roster form and in set-builder notation.

37. U is the set of odd natural numbers that are less than 12.

Write the solutions of each inequality in set-builder notation.

38. $-(2x - 3) + 7 \geq -12 - 4x$

39. Suppose $D = \{x \mid x \text{ is a multiple of } 4, x \geq 16\}$ is the universal set and $E = \{16, 20, 24\}$. What is E' ?

List all the subsets of each set.

40. $\{19\}$

41. $\{\text{green, blue, red}\}$

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Find each union or intersection.

Let $A = \{20, 24, 28, 32\}$, $B = \{x | x \text{ is a positive even integer greater than } 25 \text{ and less than } 35\} = \{26, 28, 30, 32\}$,
 $C = \{25, 26, 27, 28, 29\}$, and $D = \{x | x \text{ is a multiple of } 3, \text{ greater than } 20 \text{ and less than } 31\} = \{21, 24, 27, 30\}$.

42. $A \cup B$

43. $A \cup C$

44. $B \cup D$

45. $C \cup D$

46. $A \cap D$

47. $B \cap C$

Solve each inequality. Write the solutions as either the union or intersection of two sets.

48. $30 > |3x + 9|$

49. $7x + 2(3x - 11) \leq 17x < 3$

Draw a Venn diagram to represent the union and intersection of these sets.

50. Let $A = \{x | x \text{ is an positive integer less than or equal to } 11\}$ and $B = \{x | x \text{ is an positive integer greater than } 8\}$. Find $A \cap B$ and $A \cup B$.

