

# Inequalities and Constraints

Solving and interpreting inequalities, including compound cases.

Name \_\_\_\_\_ Date \_\_\_\_\_

32 main 2-up grid 2 pages

## Completion Reward



Shown here as a small pack artifact, not a preview destination.

1. What does  $x > 4$  mean?

- A. x is any number greater than 4
- B. x is 4 only
- C. x is any number less than 4
- D. x is any number at least 4

2. Which value satisfies  $x \geq -2$ ?

- A. -3
- B. -2
- C. -5
- D. -7

3. Which inequality matches the phrase at least 8?

- A.  $x \leq 8$
- B.  $x > 8$
- C.  $x < 8$
- D.  $x \geq 8$

4. Which phrase matches  $n \leq 12$ ?

- A. n is no more than 12.
- B. n is at least 12.
- C. n is greater than 12.
- D. n is exactly 12 and nothing else.

5. Which inequality matches the number line?



A filled endpoint means the boundary value is included.

- A.  $x < -2$
- B.  $x \geq -2$
- C.  $x \leq -2$
- D.  $x > -2$

6. Which inequality means at least 10 students?

- A.  $x > 10$
- B.  $x \leq 10$
- C.  $x \geq 10$
- D.  $x < 10$

7. Solve  $x + 3 > 9$ . Answer as an inequality in x.

8. When do you reverse an inequality sign?

- A. When multiplying or dividing by a negative number
- B. When adding any number
- C. Whenever x appears on both sides
- D. Whenever the answer is a fraction

9. Which inequality matches the number line?



The boundary value 3 is included, so the circle is closed.

- A.  $x > 3$
- B.  $x \leq 3$
- C.  $x \geq 3$
- D.  $x < 3$

10. Which value satisfies  $-1 < x \leq 3$ ?

- A. 0
- B. -1
- C. 4
- D. 5

11. Which inequality matches the number line?



-1 is included and 4 is excluded, so the left endpoint is closed and the right is open.

- A.  $-1 < x \leq 4$
- B.  $-1 < x < 4$
- C.  $-1 \leq x \leq 4$
- D.  $-1 \leq x < 4$

12. Which inequality matches the number line?



The boundary value 2 is not included and the solutions extend to smaller numbers.

- A.  $x < 2$
- B.  $x \leq 2$
- C.  $x \geq 2$
- D.  $x > 2$

13. What is the best next step to solve  $-4x + 7 > -9$ ?

- A. Add 4x to both sides.
- B. Subtract 7 from both sides.
- C. Divide both sides by -4 right away.
- D. Reverse the inequality sign first.

14. A student solves  $-5x < 20$  and gets  $x < -4$ . What is wrong?

- A. You never divide both sides of an inequality.
- B. Dividing by -5 should reverse the inequality, so the answer is  $x > -4$ .
- C. The answer should be  $x < 4$ .
- D. The variable should stay negative no matter what.

15. A student solves  $x/3 > -2$  and gets  $x > 6$ . What is wrong?

- A. The inequality sign should reverse because 3 is negative.
- B. Multiplying by 3 gives  $x > -6$ , not  $x > 6$ .
- C. You should divide by 3 again.
- D. The answer should be  $x < -6$ .

16. A student solves  $-3x \leq 12$  and gets  $x \leq -4$ . What is wrong?

- A. They should have added 3 instead.
- B. They should have multiplied by 12.
- C. They forgot to reverse the inequality sign.
- D. There is no mistake.

17. A student solves  $-2x > 6$  and writes  $x > -3$ . What is wrong?

- A. They should add 2 to both sides first
- B. They should reverse the inequality when dividing by -2
- C. x really is greater than -3
- D. The solution should be  $x = -3$  only

18. Solve  $-2x > 8$ . Answer as an inequality in x.

19. Solve  $7 - x < 3$ .

- A.  $x < 4$
- B.  $x \leq 4$
- C.  $x > 4$
- D.  $x \geq 4$

20. Solve  $5x + 2 > 3x + 10$ .

- A.  $x < 4$
- B.  $x > 4$
- C.  $x > -4$
- D.  $x < -4$

21. Solve  $3x - 5 \leq 10$ . Answer as an inequality in  $x$ .

22. Solve  $2x + 1 < x + 8$ . Answer as an inequality in  $x$ .

23. Solve  $7 - 2x \geq 1$ . Answer as an inequality in  $x$ .

24. Solve  $4 - 3x < 13$ . Answer as an inequality in  $x$ .

25. Solve  $1 < x + 4 < 7$ . Answer as an inequality in  $x$ .

26. Solve  $2x - 5 \leq 9$ .

- A.  $x \leq 2$
- B.  $x \leq 7$
- C.  $x \geq 7$
- D.  $x \geq 2$

27. Which solved form is correct for  $-x \geq 4$ ?

- A.  $x \geq -4$
- B.  $x \leq 4$
- C.  $x \leq -4$
- D.  $x \geq 4$

28. You need at least 35 points. You already have 11 points and earn 4 points per level. Which solution tells how many more levels  $x$  you need?

- A.  $x \leq 6$
- B.  $x \geq 5$
- C.  $x \leq 5$
- D.  $x \geq 6$

29. What is the best next step to solve  $-3 < 2x + 1 \leq 9$ ?

- A. Divide all three parts by 2 first.
- B. Reverse both inequality signs.
- C. Add 3 to the middle expression only.
- D. Subtract 1 from all three parts.

30. Solve  $5(x - 1) > 3x + 7$ . Answer as an inequality in  $x$ .

31. Which compound inequality is equivalent to  $2 < x - 1 \leq 8$ ?

- A.  $1 < x \leq 7$
- B.  $3 \leq x < 9$
- C.  $3 < x \leq 9$
- D.  $2 < x \leq 8$

32. Which compound inequality is equivalent to  $-2 \leq 3x + 1 < 10$ ?

- A.  $-3 \leq x < 9$
- B.  $-1 < x \leq 3$
- C.  $-2 \leq x < 10$
- D.  $-1 \leq x < 3$