Name _____ Date _____

We're Shipping Out!
Solving and Graphing Compound Inequalities

Vocabulary

Match each definition to its corresponding term.

1. compound inequality
2. solution of a compound inequality
3. conjunction
4. disjunction

a. a solution of a compound inequality in the form $a < x < b$, where a and b are any real numbers

b. an inequality that is formed by the union, "or," or the intersection, "and," of two simple inequalities

c. the part or parts of the solutions that satisfy both of the inequalities

d. a solution of a compound inequality in the form $x < a$ or $x > b$, where a and b are any real numbers

Problem Set

Write each compound inequality in compact form.

1. All numbers less than or equal to 22 and greater than -4

   $22 \geq x > -4$

2. All numbers less than 55 and greater than 45

3. All numbers greater than or equal to 0 and less than or equal to 6

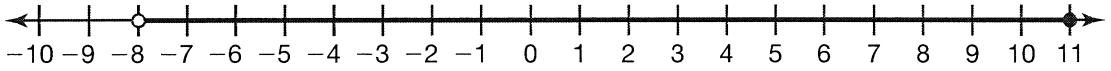
4. All numbers greater than 10 and less than 1000

5. All numbers less than or equal to 87 and greater than or equal to 83

6. All numbers greater than -1 and less than or equal to 39

Write an inequality for each graph.

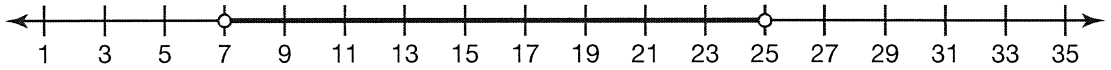
7.



$-8 < x \leq 11$

8.

9.



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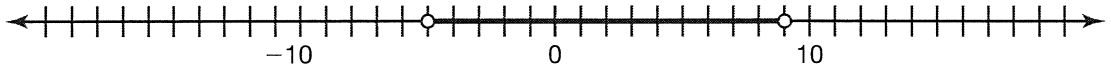

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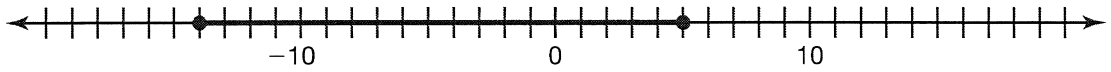

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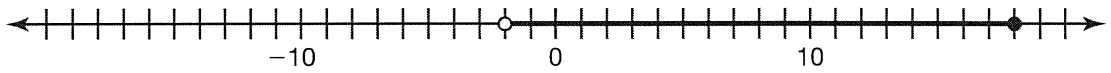
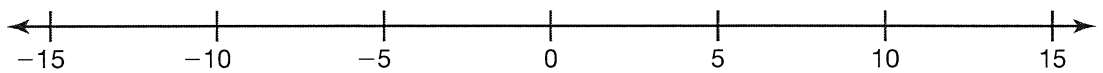


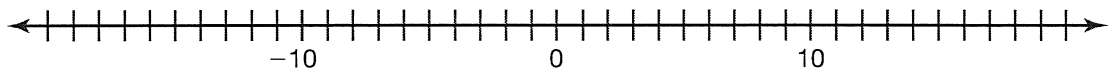
Graph each inequality.

13. $45 < x < 75$

14. $-5 < x < 5$



15. $-13 \leq x \leq 5$



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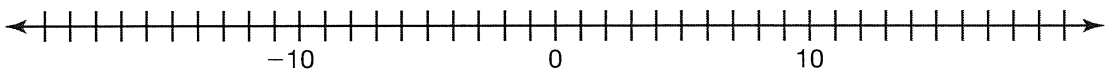
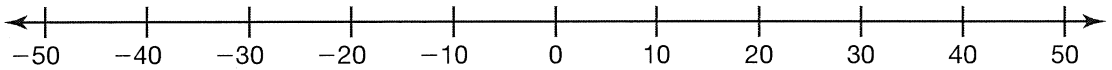
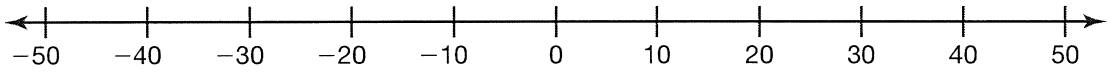
16. $-6 \leq x < 19$



17. $-35 \leq x \leq 50$



18. $-5 < x \leq 45$



Write a compound inequality for each situation.

19. The flowers in the garden are 6 inches or taller *or* shorter than 3 inches.

$x \geq 6$ or $x < 3$

20. People with a driver's license are at least 16 years old *and* no older than 85 years old.

21. Kyle's car gets more than 31 miles per gallon on the highway *or* 26 miles or less per gallon in the city.

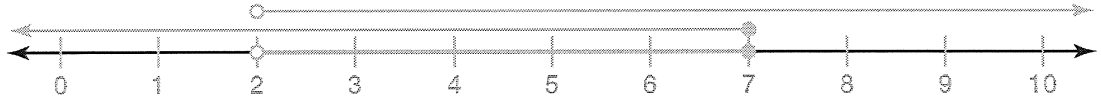
22. The number of houses that will be built in the new neighborhood must be at least 14 and no more than 28.

23. At the High and Low Store, they sell high-end items that sell for over $1000 and low-end items that sell for less than $10.

24. The heights of the twenty tallest buildings in New York City range from 229 meters to 381 meters.

Represent the solution to each part of the compound inequality on the number line. Then write the final solution that is represented by each graph.

25. $x > 2$ and $x \leq 7$

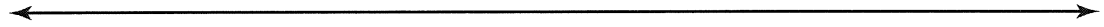


$2 < x \leq 7$

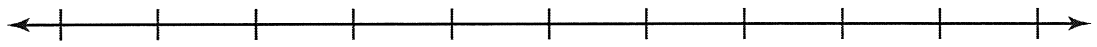
26. $x > 10$ or $x > 6$

27. $x \geq 5$ or $x < 3$

28. $x > 4$ and $x < 3$



29. $x \leq -1$ or $x > 0$



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30. $8 > x \geq -8$

31. $x \leq 9$ and $x \geq 2$

32. $x > -11$ or $x \leq -11$

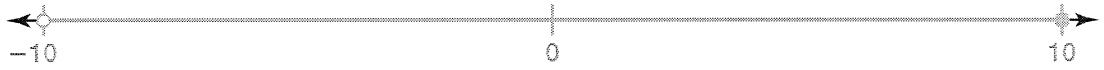
Solve each compound inequality. Then graph and describe the solution.

33. $-3 < x + 7 \leq 17$

$-3 < x + 7 \leq 17$

$-3 - 7 < x + 7 - 7 \leq 17 - 7$

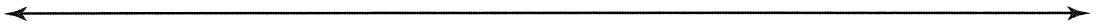
$-10 < x \leq 10$



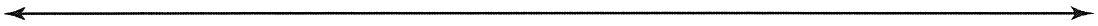
Solution: $-10 < x \leq 10$

34. $4 \leq 2x + 2 < 12$

35. $x + 5 > 14$ or $3x < 9$



36. $-5x + 1 \geq 16$ or $x - 6 \leq -8$



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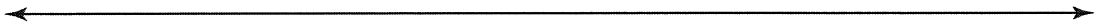
37. $28 \leq \frac{7}{8}x < 42$



38. $-2x + 5 \leq 9$ or $-x - 13 > -31$