2 Chapter Test

Write the sentence as an inequality.

1. The sum of a number y and 9 is at least -1.
2. A number r is more than 0 or less than or equal to -8.
3. A number k is less than 3 units from 10.

Solve the inequality. Graph the solution, if possible.

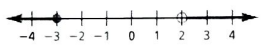
4. $\frac{x}{2} - 5 \geq -9$
5. $-4s < 6s + 1$
6. $4p + 3 \geq 2(2p + 1)$
7. $-7 < 2c - 1 < 10$
8. $-2 \leq 4 - 3a \leq 13$
9. $-5 < 2 - h$ *or* $6h + 5 > 71$
10. $|2q + 8| > 4$
11. $-2|y - 3| - 5 \geq -4$
12. $4|-3b + 5| - 9 < 7$

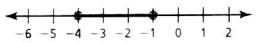
13. You start a small baking business, and you want to earn a profit of at least \$250 in the first month. The expenses in the first month are \$155. What are the possible revenues that you need to earn to meet the profit goal?

14. A manufacturer of bicycle parts requires that a bicycle chain have a width of 0.3 inch with an absolute deviation of at most 0.0003 inch. Write and solve an absolute value inequality that represents the acceptable widths.

15. Let a, b, c, and d be constants. Describe the possible solution sets of the inequality $ax + b < cx + d$.

Write and graph a compound inequality that represents the numbers that are *not* solutions of the inequality represented by the graph shown. Explain your reasoning.

16. 

17. 

18. A state imposes a sales tax on items of clothing that cost more than \$175. The tax applies only to the difference of the price of the item and \$175.
    a. Use the receipt shown to find the tax rate (as a percent).
    b. A shopper has \$430 to spend on a winter coat. Write and solve an inequality to find the prices p of coats that the shopper can afford. Assume that $p \geq 175$.
    c. Another state imposes a 5% sales tax on the entire price of an item of clothing. For which prices would paying the 5% tax be cheaper than paying the tax described above? Write and solve an inequality to find your answer and list three prices that are solutions.

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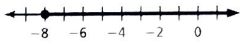
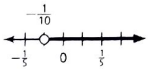
ANSWERS

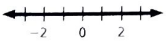
1. $y + 9 \geq -1$
2. $r > 0$ *or* $r \leq -8$
3. $|k - 10| < 3$
4. $x \geq -8$



5. $s > -\frac{1}{10}$

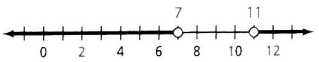


6. all real numbers

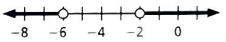


7. See Additional Answers.
8. $-3 \leq a \leq 2$

9. $h < 7$ *or* $h > 11$



10. $q < -6$ *or* $q > -2$

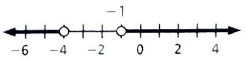


11. no solution
12. $\frac{1}{3} < b < 3$

13. at least \$405
14. $|w - 0.3| \leq 0.0003$; between 0.2997 in. and 0.3003 in.
15. all real numbers; no solution; $x < \frac{d-b}{a-c}$; $x > \frac{d-b}{a-c}$
16. $-3 < x \leq 2$

The values between -3 and 2, including 2, are not solutions.

17. $x < -4$ *or* $x > -1$



The values greater than -1 or less than -4 are not solutions.

18. a. 6.25%
    b. $175 + 1.0625(p - 175) \leq 430$; $p \leq 415$
    c. $1.05p < 175 + 1.0625(p - 175)$; $p > 875$; *Sample answers:* \$900, \$950, \$1000