Name _____ Date _____

LESSON 5.3

Challenge Practice

For use with the lesson "Solve Multi-Step Inequalities"

In Exercises 1–5, *a, b, c,* and *d* are real numbers such that $d < c < 0 < b < a$. Tell whether the statement is *always true*, *sometimes true*, or *never true*. If it is sometimes true, give a set of values for which it is true and a set of values for which it is false.

1. $a + c > cd$
2. $ab > c + d$
3. $-(a + b) < cd$
4. $(a + c)d < (a + b)d$
5. $abc + d > abd + c$

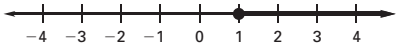
In Exercises 6–10, use the following information.

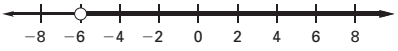
Rose is planting a rectangular herb garden. She has enough seed to cover 432 square inches of ground. Express the length of the garden as x and the width of the garden as y.

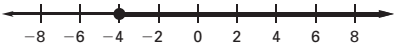
6. Write an inequality relating x and y. Then solve the inequality for x.
7. If the width of the garden must be between 4 inches and 8 inches, what are the smallest and largest possible lengths?
8. Is 12 inches a possible length for the garden? If so, what is the maximum possible width?
9. Rose decides to plant exactly 432 square inches of herb garden. She wants to enclose the rectangular garden with rabbit-proof fencing. Rose has only 100 inches of fencing. Write an inequality using x that expresses the 100-inch limit on the length of the fencing.
10. If the length of the garden is 12 inches will Rose be able to enclose the garden with the rabbit-proof fencing? If so, how much fencing will be left over?

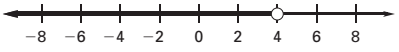
Lesson 5.3 Solve Multi-Step Inequalities, continued

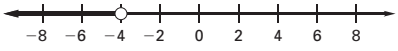
Practice Level C

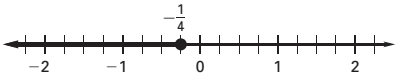
1. $x \geq 1$; 

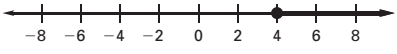
2. $p > -6$; 

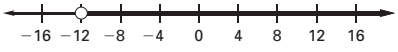
3. $n \geq -4$; 

4. $d < 4$; 

5. $y < -4$; 

6. $a \leq -\frac{1}{4}$; 

7. $m \geq 4$; 

8. $d > -12$; 

9. all real numbers **10.** no solution

11. all real numbers **12.** no solution

13. no solution **14.** no solution **15.** no solution

16. all real numbers **17.** no solution

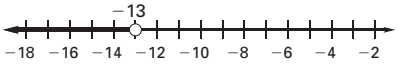
18. $z \geq -3$ **19.** no solution **20.** all real numbers

21. $c > -\frac{1}{3}$ **22.** no solution **23.** no solution

24. all real numbers **25.** all real numbers

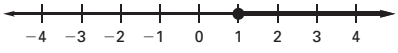
26. no solution

27. $4x + 2x < 5x - 13$; $x < -13$;



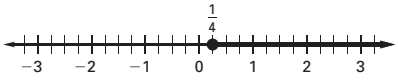
28. $3(2x + 1) \geq -2(3 + x)$; $x \geq -\frac{9}{8}$;

29. $2(5 - x) \leq 5x + 3x$; $x \geq 1$;



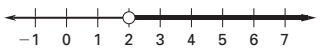
30. $32 - 4x \leq -4(-8 - x)$; $x \geq 0$;

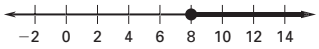
31. $3(2 - 4x) \leq 5x + 7x$; $x \geq \frac{1}{4}$;

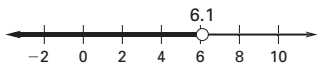


32. a. $5d - 250 > 0$ **b.** more than 50 daffodils **c.** Yes, because they need at least 50 daffodils to sell. **33. a.** $0.06(p - 50)$ **b.** $(p - 50) + 0.06(p - 50) \leq 1000$; $p \leq 993.40$

Study Guide

1. $x > 2$; 

2. $8 \leq x$; 

3. $x < 6.1$; 

4. $x > 6$ **5.** $3 \leq x$ **6.** $x < -8$ **7.** $-4 > 1$, no solutions **8.** $-13 < -6$, all real numbers

9. $6 \geq -4$, all real numbers

Interdisciplinary Application

1. $3.5x + 40 \geq 0$ **2.** $29.6x + 108 \geq 0$

3. $16.9x + 40 \geq 0$

Challenge Practice

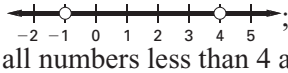
1. sometimes true; true if $a = 5$, $b = 1$, $c = -\frac{1}{2}$, and $d = -1$; false if $a = 2$, $b = 1$, $c = -1$, and $d = -2$ **2.** always true **3.** always true **4.** never true **5.** sometimes true; true if $a = 2$, $b = 1$, $c = -1$, and $d = -2$; false if $a = 1$, $b = \frac{1}{2}$, $c = -1$, and $d = -2$ **6.** $xy \leq 432$; $x \leq \frac{432}{y}$

7. 54 in. and 108 in. **8.** yes; 36 in.

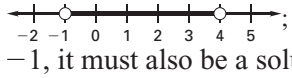
9. $2x + \frac{864}{x} \leq 100$ **10.** yes; 4 in.

Lesson 5.4 Solve Compound Inequalities

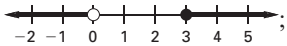
Teaching Guide

1. 

; The graphs intersect for all numbers less than 4 and greater than -1.

2. 

; If 3 is a solution of $x > -1$, it must also be a solution of $x < 4$ because 3 lies between -1 and 4.

3. 

; The graphs do not intersect.

4. If 4 is a solution of $x \geq 3$, it is not also a solution of $x < 0$ because 4 lies only to the right of 3.

Practice Level A

1. $4 \leq x \leq 8$ **2.** $x < -3$ or $x > 0$ **3.** $-1 \leq x < 3$

4. $x < 0$ *or* $x \geq 3$ **5.** $-4 < x \leq 0$

6. $x \leq -6$ or $x > -3$

7.