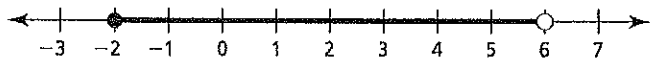
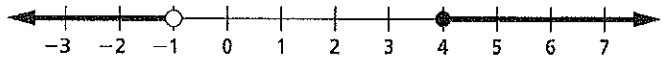
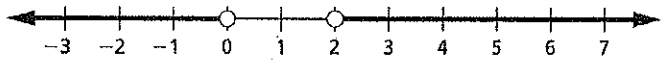
Name _____ Date _____

2.5 Practice B

In Exercises 1–3, write a compound inequality that is represented by the graph.

1. 

2. 

3. 

In Exercises 4 and 5, write the sentence as an inequality. Graph the inequality.

4. A number d is less than or equal to 2 and greater than or equal to -2.

5. A number m is no less than -1 or less than or equal to $-5\frac{1}{3}$.

In Exercises 6–11, solve the inequality. Graph the solution.

6. $-2 \geq 10 - 3g \geq -8$

7. $-4 < 2p + 8 < 18$

8. $-13 > q + 2$ *or* $5q \geq -15$

9. $15 < -v - 8$ *or* $3v + 4 \geq 10$

10. $-6 < \frac{1}{3}(6y + 12) < 14$

11. $42 < 6(3 - k)$ *or* $\frac{1}{2}(14k - 8) \geq 10$

12. A tuxedo rental shop rents tuxedos with sleeve lengths from 20 inches to 40 inches. The shop says the length of the sleeves should be about 1.2 times a person's arm length. Write and solve a compound inequality that represents the arm lengths of people the shop does *not* provide tuxedos for.

In Exercises 13–16, solve the inequality. Graph the solution, if possible.

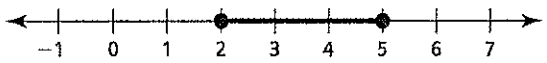
13. $8w - 5 > 12w + 3$ *or* $3 > -\frac{3}{4}w + 9$

14. $2t - 15 < 3t - 17$ *and* $t - 13 < -19$

15. $3d + 17 \leq 11$ *or* $-4d + 4 < -3d + 24$

16. $4x - 9 < 9x + 6 < 4x + 16$

17. Write a real-life story that can be modeled by the graph.



Name_____ Date_____

2.5 Enrichment and Extension

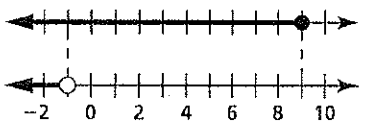
Special Cases of Compound Inequalities

Example: Solve the compound inequality, graph the solution, and then state the solution in interval notation: $2x < x - 1$ *and* $10 \geq 2(x + 4)$.

$2x < x - 1$ *and* $10 \geq 2(x - 4)$

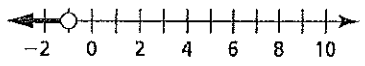
$x < -1$ *and* $5 \geq x - 4$

$x < -1$ *and* $x \leq 9$



The graphs only overlap at $x < -1$.

So, the answer is only $x < -1$.



Interval Notation: $(-\infty, -1)$

Solve the compound inequality, graph the solution, and state the solution in interval notation, if possible.

1. $9x - 5 - 4x \geq 3x + 5$ *or* $2(3x + 1) \geq 5x$

2. $6x + 2 \leq 5x + 1$ *and* $8 \geq 4(x - 1)$

3. $5 \leq -2x + 3 < 1$

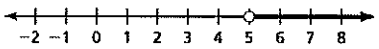
4. $2x + 5 < x + 9$ *or* $\frac{3x - 2}{4} \geq 4$

5. $5x + 3 < 4(x + 1)$ *or* $2x - 5 \geq 6x - 11 - 3x$

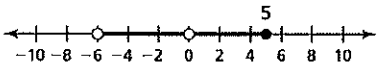
6. $\frac{7x - 5}{3} \geq 3$ *and* $3x + 1 \geq 4x - 1$

Answers

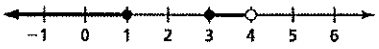
4. $\{p \in \mathbb{R} \mid p > 5\}$, $(5, \infty)$



5.
$\{x \in \mathbb{R} \mid -6 < x < 0, 0 < x \leq 5\}$, $(-6, 0) \cup (0, 5]$



6. $\{y \in \mathbb{R} \mid y \leq 1, 3 \leq y < 4\}$, $(-\infty, 1] \cup [3, 4)$



7. $\{y \in \mathbb{R} \mid y \leq -1, y \geq 4\}$, $(-\infty, -1] \cup [4, \infty)$

8. $\{x \in \mathbb{R} \mid -5 \leq x < 0\}$, $[-5, 0)$

9. $\{x \in \mathbb{R} \mid -0.5 < x < 2, x \geq 2.5\}$,
$(-0.5, 2) \cup [2.5, \infty)$

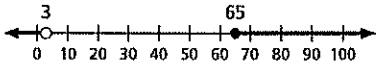
10. $\{y \in \mathbb{R} \mid y \neq 0\}$, $(-\infty, 0) \cup (0, \infty)$

2.4 Puzzle Time

IN THE KITTY POOL

2.5 Start Thinking

$x < 3$ or $x \geq 65$



The zoo charges an entry fee for people ages 3 and older who are less than 65 years old.

2.5 Warm Up

1. $x > 6$ **2.** $x < -3$ **3.** $x \geq 6$

4. $x < 2$ **5.** $x > 3$ **6.** $x < -2$

2.5 Cumulative Review Warm Up

1. $z = -10$ **2.** $h = 11$ **3.** $y = 6$

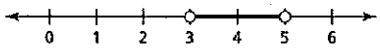
4. $v = 16$ **5.** $c = -8$

2.5 Practice A

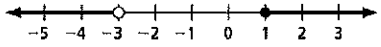
1. $-4 < x < 1$ **2.** $2 \leq x < 7$

3. $x < 2$ and $x \geq 5$

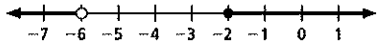
4. $3 < t < 5$



5. $m < -3$ or $m \geq 1$

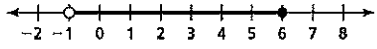


6. $s \geq -2$ or $s < -6$

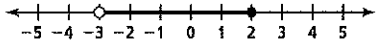


7. $36 \leq w \leq 42$

8. $-1 < x \leq 6$

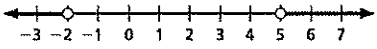


9. $-3 < t \leq 2$

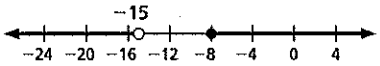


10. $3 \leq q < 5$

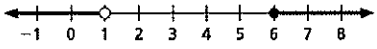
11. $h < -2$ *or* $h > 5$



12. $m < -15$ or $m \geq -8$



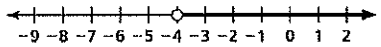
13. $w < 1$ *or* $w \geq 6$



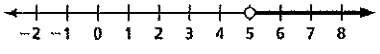
14. $0.6L < 18$ or $0.6L > 26$; $L < 30$ or $L > 43\frac{1}{3}$

15. no solution

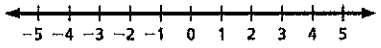
16. $p > -4$



17. $n > 5$



18. all real numbers



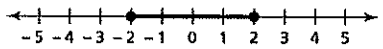
2.5 Practice B

1. $-2 \leq x < 6$ **2.** $x < -1$ or $x \geq 4$

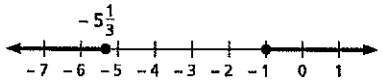
3. $x < 0$ or $x > 2$

Answers

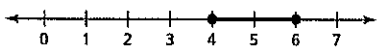
4. $-2 \leq d \leq 2$



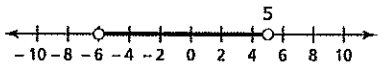
5. $m \geq -1$ *or* $m \leq -5\frac{1}{3}$



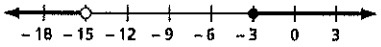
6. $4 \leq g \leq 6$



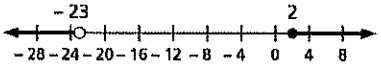
7. $-6 < p < 5$



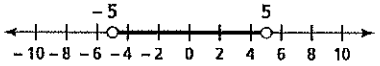
8. $q < -15$ or $q \geq -3$



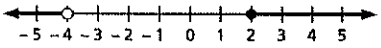
9. $v < -23$ or $v \geq 2$



10. $-5 < y < 5$

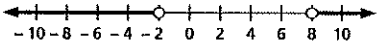


11. $k < -4$ or $k \geq 2$



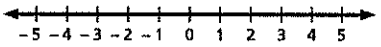
12. $1.2a < 20$ or $1.2a > 40$; $a < 16\frac{2}{3}$ or $a > 33\frac{1}{3}$

13. $w < -2$ or $w > 8$

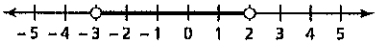


14. no solution

15. all real numbers



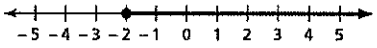
16. $-3 < x < 2$



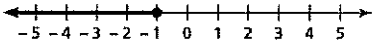
17. Your personal goal is to exercise a minimum of two hours per week and a maximum of five hours per week.

2.5 Enrichment and Extension

1. $x \geq -2$, $[-2, \infty)$

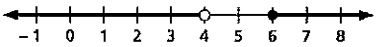


2. $x \leq -1$, $(-\infty, -1]$

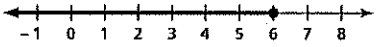


3. no solution

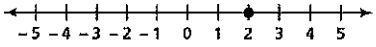
4. $x < 4$ or $x \geq 6$, $(-\infty, 4) \cup [6, \infty)$



5. $x \leq 6$, $(-\infty, 6]$



6. $x = 2$



2.5 Puzzle Time

GREAT RED SPOT

2.6 Start Thinking

Sample answer:

x	$\lvert x - 3 \rvert$	yes or no
−2	5	yes
−1	4	yes
0	3	yes
1	2	yes
2	1	no
3	0	no
4	1	no
5	2	yes
6	3	yes

no; Opposite values do not always give the same result because the order of operations prompts you to subtract 3 from the value before taking the absolute value.

2.6 Warm Up

1. $w = -7$ or 7

2. no solution

3. $m = -2$ or 10

4. $d = -7$ or 7