NAME _____ DATE _____ PERIOD ____

1-5

Practice

Solving Inequalities

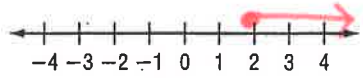
Solve each inequality. Describe the solution set using set-builder or interval notation. Then, graph the solution set on a number line.

1. $8x - 6 \geq 10$

$8x \geq 16$

$x \geq 2$

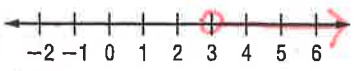
$[2, \infty)$



2. $23 - 4u < 11$

$u > 3$

$(3, \infty)$

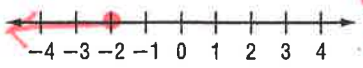


3. $-16 - 8r \geq 0$

$-8r \geq -16$

$r \leq -2$

$(-\infty, -2]$



4. $14s < 9s + 5$

$s < 1$

$(-\infty, 1)$

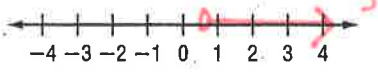
5. $9x - 11 > 6x - 9$

$3x - 11 > -9$

$3x > 2$

$x > \frac{2}{3}$

$(\frac{2}{3}, \infty)$



6. $-3(4w - 1) > 18$

$w < -\frac{5}{4}$

$(-\infty, -\frac{5}{4})$

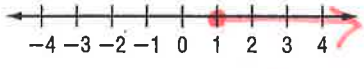
7. $1 - 8u \leq 3u - 10$

$1 \leq 11u - 10$

$11 \leq 11u$

$u \geq 1$

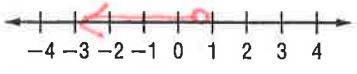
$[1, \infty)$



8. $17.5 < 19 - 2.5x$

$x < 0.6$

$(-\infty, 0.6)$



9. $9(2r - 5) - 3 < 7r - 4$

$18r - 45 - 3 < 7r - 4$

$18r - 48 < 7r - 4$

$11r < 44$

$r < 4$

$(-\infty, 4)$

10. $1 + 5(x - 8) \leq 2 - (x + 5)$

$x \leq 6$

$(-\infty, 6]$

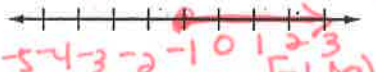
11. $\frac{4x - 3}{2} \geq -3.5$

$4x - 3 \geq -7$

$4x \geq -4$

$x \geq -1$

$[-1, \infty)$



12. $q - 2(2 - q) \leq 0$

$q \leq \frac{4}{3}$

$(-\infty, \frac{4}{3}]$

13. $-36 - 2(w + 77) > -4(2w + 52)$

$-36 - 2w - 154 > -8w - 208$

$-8w > 208$

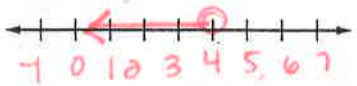
$w > -3$

$(-3, \infty)$

14. $4n - 5(n - 3) > 3(n + 1) - 4$

$n < 4$

$(-\infty, 4)$



Define a variable and write an inequality for each problem. Then solve.

15. Twenty less than a number is more than twice the same number.

$n - 20 > 2n$ $\quad n < -20$

16. Four times the sum of twice a number and −3 is less than 5.5 times that same number.

$4[2n + (-3)] < 5.5n$ $\quad n < 4.8$

17. HOTELS The Lincoln's hotel room costs $90 a night. An additional 10% tax is added. Hotel parking is $12 per day. The Lincoln's expect to spend $30 in tips during their stay. Solve the inequality $90x + 90(0.1)x + 12x + 30 \leq 600$ to find how many nights the Lincoln's can stay at the hotel without exceeding total hotel costs of $600.

5 nights

18. BANKING Jan's account balance is $3800. Of this, $750 is for rent. Jan wants to keep a balance of at least $500. Write and solve an inequality describing how much she can withdraw and still meet these conditions.

$3800 - 750 - w \geq 500$

$w \leq 2550$

NAME _____ DATE _____ PERIOD ____

1-4

Practice

Solving Absolute Value Equations

Evaluate each expression if $a = -1$, $b = -8$, $c = 5$, and $d = -1.4$.

1. $|6a|$ $|6(-1)| = |-6| = 6$

2. $|2b + 4|$ 12

3. $-|10d + a|$ $= -|10(1.4) + (-1)| = -|15| = -15$

4. $|17c| + |3b - 5|$ 114

5. $-6|10a - 12|$ $= -6|10(-1) - 12| = -6|-22| = -132$

6. $|2b - 1| - |-8b + 5|$ -52

7. $|5a - 7| + |3c - 4|$ $|5(-1) - 7| + |3(5) + 4|$ 23

8. $|1 - 7c| - |a|$ 33

9. $-3|0.5c + 2| - |-0.5b|$ $-3|0.5(5) + 2| - |-0.5(8)|$ -17.5

10. $|4d| + |5 - 2a|$ 12.6

11. $|a - b| + |b - a|$ $|-1 - (-8)| + |-8 - (-1)| = 14$

12. $|2 - 2d| - 3|b|$ -19.2

Solve each equation. Check your solutions.

13. $|n - 4| = 13$ $n - 4 = 13$, $n = 17$; $n - 4 = -13$, $n = -9$

14. $|x - 13| = 2$ $x = 15$, $x = 11$

15. $|2y - 3| = 29$ $2y - 3 = 29$, $y = 16$; $2y - 3 = -29$, $y = -13$

16. $7|x + 3| = 42$ $x = 3$, $x = -9$

17. $|3u - 6| = 42$ $3u - 6 = 42$, $u = 16$; $3u - 6 = -42$, $u = -12$

18. $|5x - 4| = -6$ $\varnothing$

19. $-3|4x - 9| = 24$ $|4x - 9| = -8$ $\varnothing$

20. $-6|5 - 2y| = -9$ $y = 1.75$, $y = 3.25$

21. $|8 + p| = 2p - 3$ $8 + p = 2p - 3$, $p = 11$; $8 + p = -(2p - 3)$

22. $|4w - 1| = 5w + 37$ $w = -38$

23. $4|2y - 7| + 5 = 9$ $2y - 7 = 1$, $y = 4$; $2y - 7 = -1$, $y = 3$

24. $-2|7 - 3y| - 6 = -14$ $y = 1$, $y = 11/3$

25. $2|4 - s| = -3s$ $4 - s = -\frac{3}{2}s$, $s = -8$; $4 - s = \frac{3}{2}s$

26. $5 - 3|2 + 2w| = -7$ $w = 1$, $w = -3$

27. $5|2r + 3| - 5 = 0$ $2r + 3 = 1$, $r = -1$; $2r + 3 = -1$, $r = -2$

28. $3 - 5|2d - 3| = 4$ $\varnothing$

29. **WEATHER** A thermometer comes with a guarantee that the stated temperature differs from the actual temperature by no more than 1.5 degrees Fahrenheit. Write and solve an equation to find the minimum and maximum actual temperatures when the thermometer states that the temperature is 87.4 degrees Fahrenheit.

$|X - 87.4| \leq 1.5$ $85.9 \leq X \leq 88.9$

30. **OPINION POLLS** Public opinion polls reported in newspapers are usually given with a margin of error. For example, a poll with a margin of error of ±5% is considered accurate to within plus or minus 5% of the actual value. A poll with a stated margin of error of ±3% predicts that candidate Tonwe will receive 51% of an upcoming vote. Write and solve an equation describing the minimum and maximum percent of the vote that candidate Tonwe is expected to receive.

$|X - 51| \leq 3$ $48 \leq X \leq 54$