DATE _____ PERIOD _____

ODDS

Write and Graph Inequalities

Example 1 **Write an inequality for the sentence.**

Fewer than 70 students attended the last dance.

Words	*Fewer than* 70 students attended the last dance.
Variable	Let s = the number of students.
Inequality	$s < 70$

Example 2 **Graph each inequality on a number line.**

a. $x > 8$

The **open dot** means 8 does *not* make the sentence true. The graph to the right means that numbers greater than 8 make the sentence true.

b. $x \leq 8$

The **closed dot** means 8 *does* make the sentence true. The graph to the left means that numbers less than 8 make the sentence true.

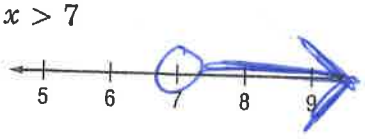
Exercises

Write an inequality for each sentence.

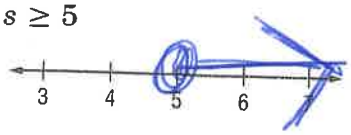
1. The maximum height h is 45 feet.
2. The weight m of all adult male elephants is over 12,000 pounds.
3. The maximum fee f for any student is $15.
4. You must be at least 38 inches tall to ride the roller coaster.

Graph each inequality on the number line.

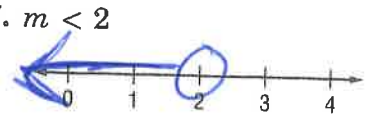
5. $x > 7$



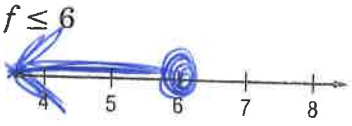
6. $s \geq 5$



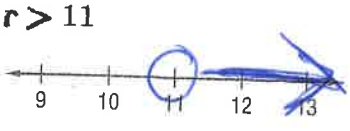
7. $m < 2$



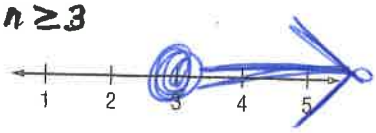
8. $f \leq 6$



9. $r > 11$



10. $n \geq 3$



Skills Practice

Write and Graph Inequalities

Write an inequality for each sentence.

1. More than 40,000 fans attended the opening football game at the University of Florida. $x > 40{,}000$

2. Her earnings were no more than $86. $x \leq 86$

3. A savings account balance is now less than $550. $x < 550$

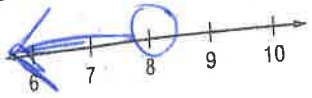
4. The number of club members is at least 25. $x \geq 25$

5. The spring calf class at the cattle show is for calves that weigh 825 pounds or less. $x \leq 825$

6. The minimum deposit for a new checking account is $75. $x \geq 75$

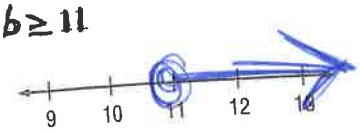
Graph each inequality on the number line.

7. $a < 8$

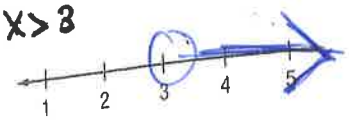


8. $d \leq 4$

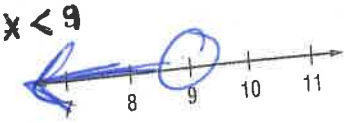
9. $b \geq 11$



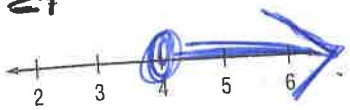
10. $x > 3$



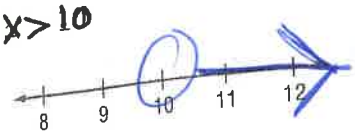
11. $x < 9$



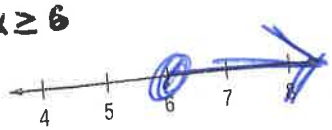
12. $r \geq 4$



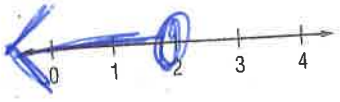
13. $x > 10$



14. $x \geq 6$



15. $x \leq 2$



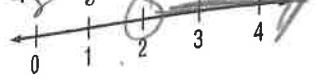
DATE _____ PERIOD _____

Skills Practice

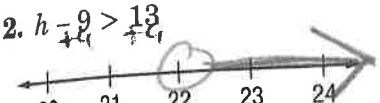
Solve One-Step Inequalities

Solve each inequality. Graph the solution on a number line.

1. $\frac{8x}{8} > \frac{16}{8}$ $x > 2$

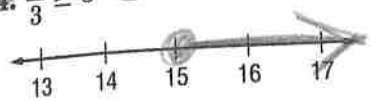


2. $h - 9 > 13$ $h > 22$



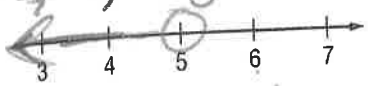
3. $t + 7 \le 12$ $t \le 5$

4. $\frac{r}{3} \ge 5$ $r \ge 15$

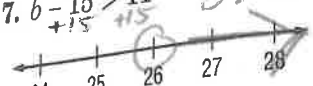


5. $j + 4 < 10$ $j < 6$

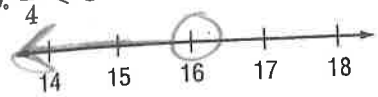
6. $7y < 35$ $y < 5$



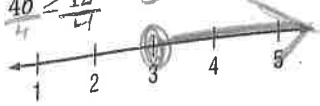
7. $b - 15 > 11$ $b > 26$



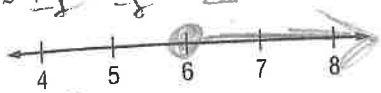
8. $\frac{n}{4} < 4$ $n < 16$



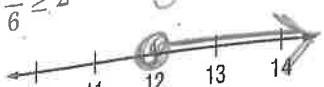
9. $\frac{4b}{4} \ge \frac{12}{4}$ $b \ge 3$



10. $z + 8 \ge 14$ $z \ge 6$

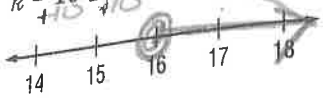


11. $\frac{y}{6} \ge 2$ $y \ge 12$



12. $j - 8 < 9$ $j < 17$

13. $k - 10 \ge 6$ $k \ge 16$



14. $\frac{6z}{6} \ge \frac{18}{6}$ $z \ge 3$

15. $\frac{12a}{12} \ge \frac{48}{12}$ $a \ge 4$

16. $\frac{s}{3} < 5$ $s < 15$

17. **SHOPPING** Chantal would like to buy a new pair of running shoes. The shoes she likes start at \$85. If she has already saved \$62, write an inequality to show how much more money Chantal must save.

$x + 62 \ge 85$ She must save at least \$23
$-62 \quad -62$
$x \ge 23$

NAME _____ DATE _____ PERIOD ____

Reteach

Two-Step Inequalities

Example **Four more than 3 times a number is less than 28. Write, solve, and graph an inequality to represent this situation.**

Words	*Four more than 3 times a number is less than 28.*
Variable	Let n = the number.
Inequality	$3n + 4 < 28$

$3n + 4 < 28$ Write the inequality.

$3n + 4 < 28$
$\quad -4 \quad -4$ Subtract 4 from each side.

$3n < 24$ Simplify.

$\frac{3n}{3} < \frac{24}{3}$ Divide each side by 3.

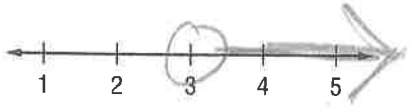
$n < 8$ Simplify.

The solution is $n < 8$. To graph it, draw an open circle at 8 and draw an arrow to the left on the number line.

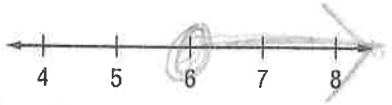
Exercises

Write, solve, and graph an inequality to represent each sentence.

1. 25 is less than 10 more than 5 times a number.
$25 < 5n + 10$
$n > 3$

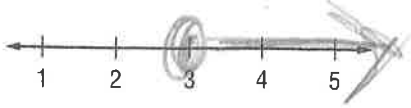


2. Eight less than 3 times a number is greater than or equal to 10.
$3x - 8 \geq 10$ $x \geq 6$



3. Five more than 6 times a number is less than or equal to 29.
$6n + 5 \leq 29$ $n \leq 4$

4. **PEDAL BOATS** It costs \$25 plus \$6 per hour to rent a pedal boat at the lake. The minimum fee is \$43. What is the minimum number of hours for which you can rent the pedal boat?
$25 + 6x \geq 43$



NAME _____ DATE _____ PERIOD ____

Skills Practice

Two-Step Inequalities

Solve and graph each inequality.

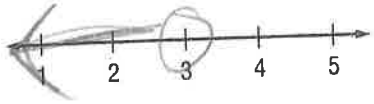
1. $12 > 6 + 2n$

$-6 \quad -6$

$\frac{6}{2} > \frac{2n}{2}$

$3 > n$

$n < 3$



2. $4n - 7 \geq 21$

$+7 \quad +7$

$\frac{4n}{4} \geq \frac{28}{4}$

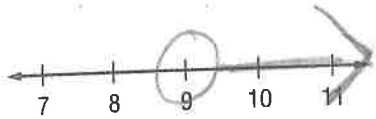
$n \geq 7$

3. $5n - 16 > 29$

$+16 \quad +16$

$\frac{5n}{5} > \frac{45}{5}$

$n > 9$

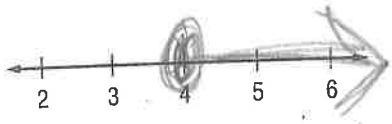


4. $24 \leq 12 + 3n$

$-12 \quad -12$

$\frac{12}{3} \leq \frac{3n}{3}$

$n \geq 4$

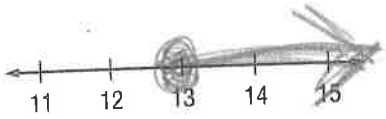


5. $2n - 9 \geq 17$

$+9 \quad +9$

$\frac{2n}{2} \geq \frac{26}{2}$

$n \geq 13$

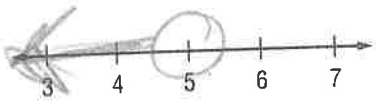


6. $56 > 6 + 10n$

$-6 \quad -6$

$\frac{50}{10} > \frac{10n}{10}$

$n < 5$



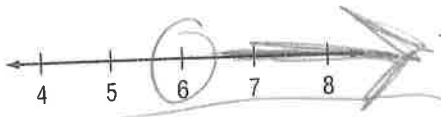
7. **SALES** Eric gets paid \$7 for each hour he works at the electronics store, plus an extra \$2 for every store membership card he sells. How many memberships does he have to sell if he wants to make more than \$40 for working 4 hours?

$7(4) + 2x > 40$

$28 + 2x > 40$

$x > 6$

more than 6 memberships.



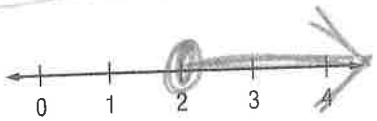
8. **CONTEST** In a class contest, students get 8 points for each book they read plus an extra 5 points for each book report they write. If a student reads 3 books and wants at least 34 points, how many reports does she have to write?

$8(3) + 5r \geq 34$

$24 + 5r \geq 34$

$r \geq 2$

at least 2 reports



Name _____ Class _____ Date _____

Practice 2-3

Simplifying Algebraic Expressions

Simplify each expression.

1. $4a + 7 + 2a$

$6a+7$

2. $8(k - 9)$

$8k - 72$

3. $5n + 6n - 2n$

$9n$

4. $(w + 3)7$

$7w+21$

5. $5(b - 6) + 9$

$5b-30+9$

$5b-21$

6. $-4 + 8(2 + t)$

$-4+16+8t$

$12+8t$

7. $-4 + 3(6 + k)$

$-4+18+3k$

$14+3k$

8. $12j - 9j$

$3j$

9. $6(d - 8)$

$6d-48$

10. $-9 + 8(x + 6)$

$-9+8x+32$

$8x+23$

11. $4(m + 6) - 3$

$4m+24-3$

$4m+21$

12. $27 + 2(f - 19)$

$27+2f-38$

$2f-11$

13. $4v - 7 + 8v + 4 - 5$

$12v-8$

14. $5(g + 8) + 7 + 4g$

$5g+48+7+4g$

$9g+55$

15. $12h - 17 - h + 16 - 2h$

$9h-1$

16. $7(e - 8) + 12 - 2e$

$7e-56+12-2e$

$5e-44$

17. $-3y + 7 + y + 6y$

$4y+7$

18. $(3.2m + 1.8) - 1.07m$

$2.13m+1.8$

4a - 28b

4(a - 7b)

9a - 3g

3(3a-g)

7a - 42z

7(a-6z)

81a + 9p

9(9a+p)

25a - 5h

5(5a-h)

7a + 63

7(a+9)

4a - 20m

4(a-5m)

4a - 24

4(a-6)

30a + 6s

6(5a+s)

3a + 24

3(a+8)

Distributive Property

1. $6(4d-11)$
   $24d-66$
2. $3(6d+8)$
   $18d+24$
3. $2(9y+11)$
   $18y+22$
4. $-5(4p+7)$
   $-20p-35$
5. $-4(5x-8)$
   $-20x+32$
6. $7(3+2x)$
   $21+14x$
7. $-(x+5)$
   $-x-5$
8. $-(-x-5)$
   $x+5$
9. $4(3r+5)$
   $12r+20$
10. $8(6+2b)$
    $48+16b$
11. $17+5(7d-8)$
    $17+35d-40$
    $35d-23$
12. $3(4z-7)+15z$
    $12z-21+15z$
    $27z-21$

Review Combining Like Terms:

13. $-13+12r+6$
    $12r-7$
14. $13-16d-9d$
    $13-25d$
15. $-x+4+5x-2$
    $4x+2$
16. $16y+8-4y-3$
    $12y+5$
17. $x+y+2x+3y$
    $3x+4y$
18. $z+z+8-10$
    $2z-2$

Factoring Expressions

1. $2x + 4$
   $2(x+2)$
2. $6t + 12$
   $6(t+2)$
3. $-4x + 8$
   $-4(x-2)$
4. $24 + 6z$
   $6(4+z)$
5. $3x + 9x$
   $3x(1+3)$
6. $-5t + 15$
   $-5(t-3)$
7. $-7x - 49$
   $-7(x+7)$
8. $36y + 6$
   $6(6y+1)$
9. $81 - 9v$
   $9(9-v)$
10. $25x + 15 + 10y$
    $5(5x+3+2y)$

Review Distributive Property:

11. $5(x + 3)$ $5x+15$
12. $-2(x + 10)$ $-2x-20$
13. $4(-x - 2)$ $-4x-8$

Review Combining Like Terms:

14. $3x - 8 + 7x - 2$
    $10x-10$
15. $-x + 5x + 10 + 12$
    $4x+22$