Name _____ Date _____ Class _____

Practice B
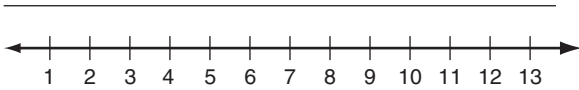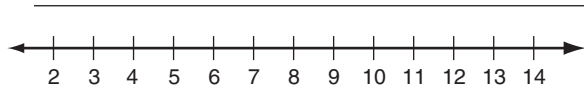## *Solving Two-Step and Multi-Step Inequalities*

Solve each inequality and graph the solutions.

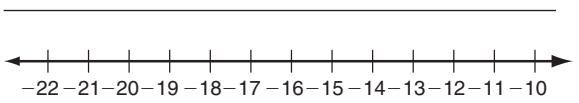**1.** $-3a + 10 < -11$

_____

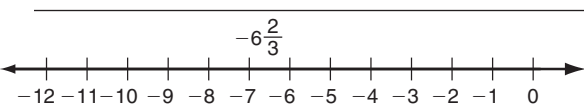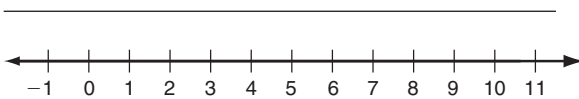**2.** $4x - 12 \geq 20$

_____

3. $\dfrac{2k - 3}{-5} > 7$

4. $-\dfrac{1}{5}z + \dfrac{2}{3} \leq 2$

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5. $6(n - 8) \geq -18$

6. $10 - 2(3x + 4) < 11$

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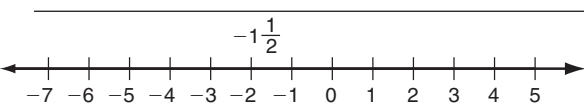
7. $7 + 2c - 4^2 \leq -9$
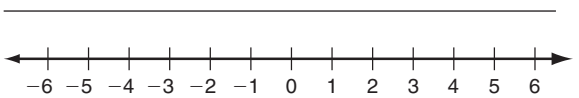
8. $15p + 3(p - 1) > 3(2^3)$
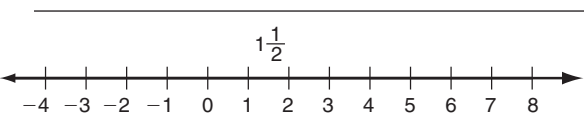
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Write and solve an inequality for each problem.

9. A full-year membership to a gym costs $325 upfront with no monthly
charge. A monthly membership costs $100 upfront and $30 per month.
For what numbers of months is it less expensive to have a monthly membership?

_____

10. The sum of the lengths of any two sides of a triangle must
be greater than the length of the third side. What are the
possible values of x for this triangle?

_____

Holt Algebra 1
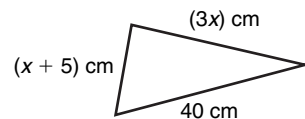
Practice A
Solving Two-Step and Multi-Step Inequalities

Fill in the blanks to solve each inequality.

1. $2x - 5 \le 7$

   $+\underline{\ 5\ }\ \ +\underline{\ 5\ }$

   $2x \le \underline{\ 12\ }$

   $\div 2\ \ \ \div 2$

   $x \le \underline{\ 6\ }$

2. $-3(k-1) < 15$

   $-3k + \underline{\ 3\ } < 15$

   $\underline{\ -3\ }\ \underline{\ -3\ }$

   $-3k < \underline{\ 12\ }$

   $\div(-3) \div(-3)$

   $k \ \underline{\ge}\ \underline{-4}$

3. $\frac{1}{2}n + \frac{5}{6} > \frac{2}{3}$

   $\underline{6}\left(\frac{1}{2}n + \frac{5}{6}\right) > \underline{6}\left(\frac{2}{3}\right)$

   $3n + 5 > \underline{\ 4\ }$

   $\underline{\ -5\ }\ \underline{\ -5\ }$

   $3n > \underline{-1}$

   $\div \underline{\ 3\ }\ \div \underline{\ 3\ }$

   $n\ \underline{>}\ \underline{-\frac{1}{3}}$

Solve each inequality and graph the solutions.

4. $5x + 7 \ge 2$

   $x \ge -1$

5. $5(z+6) \le 40$

   $z \le 2$

6. $6 - \frac{a}{3} < 2$

   $a > 12$

7. $-\frac{1}{3}x + 4 > 1$

   $x < 9$

Write and solve an inequality for each problem.

8. Ted needs an average of at least 70 on his three history tests. He has already scored 85 and 60 on two tests. What is the minimum grade Ted needs on his third test?

   $\frac{85 + 60 + x}{3} \ge 70;\ x \ge 65;$ at least 65

9. A VHS tape holds at most 360 minutes. A tape already has a 120-minute movie on it. How many 30-minute sitcoms can be recorded on the remaining tape?

   $30s + 120 \le 360;\ s \le 8;$ 0, 1, 2, 3, 4, 5, 6, 7, or 8 sitcoms

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Practice B
Solving Two-Step and Multi-Step Inequalities

Solve each inequality and graph the solutions.

1. $-3a + 10 < -11$

   $a > 7$

2. $4x - 12 \ge 20$

   $x \ge 8$

3. $\frac{2k-3}{-5} > 7$

   $k < -16$

4. $-\frac{1}{5}z + \frac{2}{3} \le 2$

   $z \ge -6\frac{2}{3}$

5. $6(n-8) \ge -18$

   $n \ge 5$

6. $10 - 2(3x+4) < 11$

   $x > -1\frac{1}{2}$

7. $7 + 2c - 4^2 \le -9$

   $c \le 0$

8. $15p + 3(p-1) > 3(2^3)$

   $p > 1\frac{1}{2}$
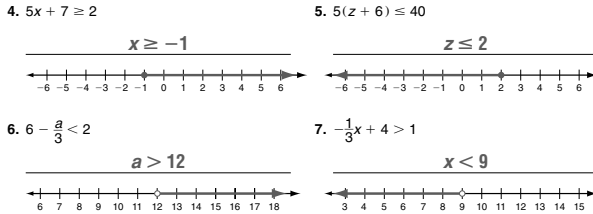
Write and solve an inequality for each problem.

9. A full-year membership to a gym costs $325 upfront with no monthly charge. A monthly membership costs $100 upfront and $30 per month. For what numbers of months is it less expensive to have a monthly membership?

   $30m + 100 < 325;\ m < 7.5;$ 1, 2, 3, 4, 5, 6, or 7 months

10. The sum of the lengths of any two sides of a triangle must be greater than the length of the third side. What are the possible values of x for this triangle?

    $(3x)$ cm
    $(x+5)$ cm
    40 cm

    $x + 5 + 3x > 40;\ x > 8.75$

Practice C
Solving Two-Step and Multi-Step Inequalities

Solve each inequality.

1. $4 \ge -3x + 5$

   $x \ge \frac{1}{3}$

2. $-2.5(y-6) \le -4.5$

   $y \ge 7.8$

3. $5 > 12a - (3 - 4a)$

   $a < \frac{1}{2}$

4. $5 < \frac{7 - 3h}{-4}$

   $h > 9$

5. $\frac{x-2}{3} \ge \frac{1}{2}$

   $x \ge 3\frac{1}{2}$

6. $\frac{3}{8}n - 2 < 1\frac{1}{5}$

   $n < 5\frac{13}{15}$ or $n < 5.8\overline{6}$

7. $-2p - 3\frac{1}{4} \le -1$

   $p \ge -1\frac{1}{8}$ or $p \ge -1.125$

8. $2^2 - (3^2)x + 14x > \frac{4^3}{2}$

   $x > 5\frac{3}{5}$ or $x > 5.6$

9. $\frac{3}{4}w - \frac{1}{2}(2w+1) < \frac{2}{5}$

   $w > -3\frac{3}{5}$ or $w > -3.6$

Write, solve, and graph an inequality for each statement.

10. Two is greater than the sum of 3 and one-fourth of a number.

    inequality: $2 > 3 + \frac{1}{4}x$

    solution: $x < -4$

    graph:

11. The product of -2 and the sum of a number and 3 is at least 0.

    inequality: $-2(x+3) \ge 0$

    solution: $x \le -3$

    graph:

Write and solve an inequality for each problem.

12. Ann's grade is the average of four scores: three chapter tests and a final that counts as two chapter tests. She scored 72, 90, and 75 on the chapter tests. What score does she need on the final to have a grade of at least 80?

    $\frac{72 + 90 + 75 + 2f}{5} \ge 80;\ f \ge 81.5;$ at least 81.5

13. Trey is limiting his diet to no more than 600 calories per meal. For lunch, he had a can of iced tea and two bowls of soup. The tea had 140 calories. What are the possible number of calories in each bowl of soup?

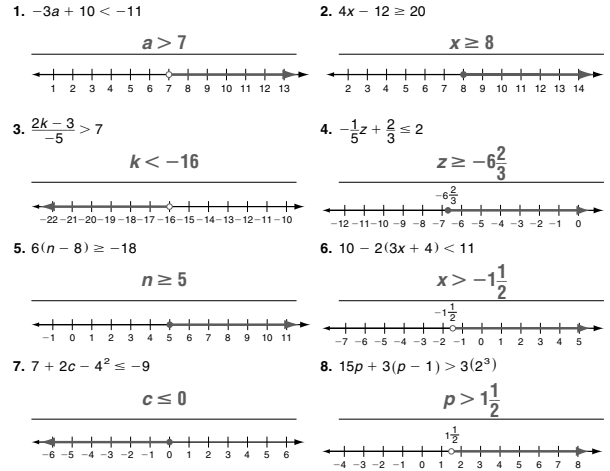 $140 + 2s \le 600;\ s \le 230;$ no more than 230 calories

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Reteach
Solving Two-Step and Multi-Step Inequalities

When solving inequalities with more than one step, use inverse operations to isolate the variable. The order of the inverse operations is the order of the operations in reverse. You can check your solution by substituting the endpoint and another point in the solution back into the original inequality.
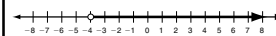
Solve $-5x + 3 < 23$ and graph the solutions.

$-5x + 3 < 23$

$\underline{-3}\ \ \underline{-3}$ Add -3 to each side.

$-5x < 20$

$\frac{-5x}{-5} < \frac{20}{-5}$ Divide both sides by -5.

$x > -4$ Reverse the inequality sign.

Check:

Try -4.

$-5x + 3 < 23$

$-5(-4) + 3 \overset{?}{<} 23$

$20 + 3 \overset{?}{<} 23$

$23 \overset{?}{<} 23$ ✗

Try 6.

$-5x + 3 < 23$

$-5(6) + 3 \overset{?}{<} 23$

$-30 + 3 \overset{?}{<} 23$

$-27 \overset{?}{<} 23$ ✓

The endpoint -4 is not a solution. The open circle on the graph is correct. The value 6 is a solution. The direction of the inequality symbol is correct.

Solve each inequality and graph the solutions.

1. $-3e - 10 \le -4$

   $e \ge -2$

2. $\frac{c}{2} + 8 > 11$

   $c > 6$

3. $15 \le 3 - 4s$

   $s \le -3$

4. $\frac{3}{4}j + 1 > 4$

   $j > 4$