1. CANOEING  If four people plan to use the canoe with 60 pounds of supplies, write and solve an inequality to find the allowable average weight per person.

**SOLUTION:**
The canoe holds a maximum of 800 pounds. The weight of 4 people plus 60 pounds is to be in the canoe. Let \( n \) represent the average weight of each person. Write an inequality.

\[
4n + 60 \leq 800 \\
4n + 60 - 60 \leq 800 - 60 \\
4n \leq 740 \\
\frac{4n}{4} \leq \frac{740}{4} \\
\]

\( n \leq 185 \)

The solution set is \( \{ n \mid n \leq 185 \} \). So, the average allowable weight per person is at most 185 pounds.

2. SHOPPING  Rita is ordering a movie for $11.95 and a few CDs. She has $50 to spend. Shipping and sales tax will be $10. If each CD costs $9.99, write and solve an inequality to find the greatest number of CDs that she can buy.

**SOLUTION:**
Rita has $50 to spend on an $11.95 movie plus a $10 fee plus an unknown number of $9.99 CDs. Let \( x \) represent the maximum number of CDs she can buy. Write an inequality.

\[
9.99x + 11.95 + 10 \leq 50 \\
9.99x + 21.95 - 21.95 \leq 50 - 21.95 \\
9.99x \leq 28.05 \\
\frac{9.99x}{9.99} \leq \frac{28.05}{9.99} \\
\]

\( x \leq 2.8 \)

The solution set is \( \{ x \mid x \leq 2.8 \} \). So, 2 is the greatest number of CDs Rita can buy.
5-3 Solving Multi-Step Inequalities

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

3. \(6h - 10 \geq 32\)

**SOLUTION:**

\[
6h - 10 \geq 32
\]
\[
6h - 10 + 10 \geq 32 + 10
\]
\[
6h \geq 42
\]
\[
\frac{6h}{6} \geq \frac{42}{6}
\]
\[
h \geq 7
\]
The solution set is \{\(h \mid h \geq 7\}\).

4. \(-3 \leq \frac{2}{3}r + 9\)

**SOLUTION:**

\[
-3 \leq \frac{2}{3}r + 9
\]
\[
-3 - 9 \leq \frac{2}{3}r + 9 - 9
\]
\[
-12 \leq \frac{2}{3}r
\]
\[
\frac{3}{2}(-12) \leq \frac{3}{2}\left(\frac{2}{3}r\right)
\]
\[
-18 \leq r
\]
\[
r \geq -18
\]
The solution set is \{\(r \mid r \geq -18\}\).

5. \(-3x + 7 > 43\)

**SOLUTION:**

\[
-3x + 7 > 43
\]
\[
-3x + 7 - 7 > 43 - 7
\]
\[
-3x > 36
\]
\[
\frac{-3x}{-3} < \frac{36}{-3}
\]
\[
x < -12
\]
The solution set is \{\(x \mid x < -12\}\).
6. \(4m - 17 < 6m + 25\)

**SOLUTION:**

\[
\begin{align*}
4m - 17 &< 6m + 25 \\
4m - 5m &< 6m - 5m + 25 \\
-2m &< 25 \\
-2m - 17 &+ 17 < 25 + 17 \\
-2m &< 42 \\
\frac{-2m}{-2} &> \frac{42}{-2} \\
m &> -21
\end{align*}
\]

The solution set is \(\{m | m > -21\}\).

---

**Define a variable, write an inequality, and solve each problem. Then check your solution.**

7. Four times a number minus 6 is greater than eight plus two times the number.

**SOLUTION:**

Let \(n\) be the number.

\[
\begin{align*}
4n - 6 &> 8 + 2n \\
4n - 2n - 6 &> 8 + 2n - 2n \\
2n - 6 &> 8 \\
2n - 6 + 6 &> 8 + 6 \\
\frac{2n}{2} &> \frac{14}{2} \\
n &> 7
\end{align*}
\]

The solution set is \(\{n | n > 7\}\).

To check this answer, substitute a number greater than 7 into the original inequality. Let \(n = 8\).

\[
\begin{align*}
4n - 6 &> 8 + 2n \\
4(8) - 6 &> 8 + 2(8) \\
32 - 6 &> 8 + 16 \\
26 &> 24
\end{align*}
\]

So, the solution checks.
8. Negative three times a number plus 4 is less than five times the number plus eight.

**SOLUTION:**

Let \( n \) = the number.

\[-3n + 4 < 5n + 8\]
\[-3n - 5n + 4 < 5n - 5n + 8\]
\[-8n + 4 < 8\]
\[-8n + 4 - 4 < 8 - 4\]
\[-8n > 4\]
\[-\frac{8n}{8} > \frac{4}{8}\]
\[n > -\frac{1}{2}\]

The solution set is \( \left\{ n \mid n > -\frac{1}{2}\right\} \).

To check this answer, substitute a number greater than \(-\frac{1}{2}\) into the original inequality. Let \( n = 0 \).

\[-3n + 4 < 5n + 8\]
\[-3(0) + 4 < 5(0) + 8\]
\[-0 + 4 < 0 + 8\]
\[4 < 8\]

So, the solution checks.
Solve each inequality. Graph the solution on a number line.

9. \(-6 \leq 3(5v - 2)\)

**SOLUTION:**

\[-6 \leq 3(5v - 2)\]

\[-6 \leq 15v - 6\]

\[-6 + 6 \leq 15v - 6 + 6\]

\[-6 + 6 \leq 15v\]

\[0 \leq 15v\]

\[\frac{0}{15} \leq \frac{15v}{15}\]

\[0 \leq v\]

\[v \geq 0\]

The solution set is \(\{v | v \geq 0\}\).

To check this answer, substitute a number greater than or equal to 0 into the original inequality. Let \(v = 1\).

\[-6 \leq 3(5v - 2)\]

\[-6 \leq 3[5(1) - 2]\]

\[-6 \leq 3(3)\]

\[-6 \leq 9\]

So, the solution checks.
10. \(-5(g + 4) > 3(g - 4)\)

**SOLUTION:**
\[-5(g + 4) > 3(g - 4)\]
\[-5g - 20 > 3g - 12\]
\[-5g - 3g > 3g - 3g - 12\]
\[-8g > 20 > -12\]
\[-8g - 20 + 20 > -12 + 20\]
\[-8g > 8\]
\[-8 < \frac{8}{-8}\]
\[g < -1\]

The solution set is \(\{g | g < -1\}\).

To check this answer, substitute a number less than \(-1\) into the original inequality. Let \(g = -2\).

\[-5(-2) + 4 > 3(-2) - 4\]
\[-5(2) > 3(-6)\]
\[-10 > -18\]

So, the solution checks.

11. \(3 - 8x \geq 9 + 2(1 - 4x)\)

**SOLUTION:**
\[3 - 8x \geq 9 + 2(1 - 4x)\]
\[3 - 8x \geq 9 + 2 - 8x\]
\[3 - 8x \geq 11 - 3 - 8x\]
\[-8x + 8x \geq 8 - 8x + 8x\]
\[0 \geq 8\]

Since the inequality results in a false statement, the solution set is the empty set, \(\emptyset\).
5-3 Solving Multi-Step Inequalities

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

12. $5b - 1 \geq -11$

**SOLUTION:**

\[
\begin{align*}
5b - 1 & \geq -11 \\
5b - 1 + 1 & \geq -11 + 1 \\
5b & \geq -10 \\
\frac{5b}{5} & \geq \frac{-10}{5} \\
b & \geq -2
\end{align*}
\]

The solution set is \( \{ b \mid b \geq -2 \} \).

13. $21 > 15 + 2a$

**SOLUTION:**

\[
\begin{align*}
21 & > 15 + 2a \\
21 - 15 & > 15 - 15 + 2a \\
6 & > 2a \\
\frac{6}{2} & > \frac{2a}{2} \\
3 & > a \\
a & < 3
\end{align*}
\]

The solution set is \( \{ a \mid a < 3 \} \).
### 5-3 Solving Multi-Step Inequalities

14. \(-9 \geq \frac{2}{5}m + 7\)

**SOLUTION:**

\[-9 \geq \frac{2}{5}m + 7\]
\[-9 - 7 \geq \frac{2}{5}m + 7 - 7\]
\[-16 \geq \frac{2}{5}m\]
\[\frac{5}{2}(-16) \geq \frac{5}{2}\left(\frac{2}{5}m\right)\]
\[-40 \geq m\]
\[m \leq -40\]

The solution set is \(\{m \mid m \leq -40\}\).

15. \(\frac{w}{8} - 13 > -6\)

**SOLUTION:**

\[\frac{w}{8} - 13 > -6\]
\[\frac{w}{8} - 13 + 13 > -6 + 13\]
\[\frac{w}{8} > 7\]
\[8\left(\frac{w}{8}\right) > 8(7)\]
\[w > 56\]

The solution set is \(\{w \mid w > 56\}\).
5-3 Solving Multi-Step Inequalities

16. \(-a + 6 \leq 5\)

**SOLUTION:**

\[-a + 6 \leq 5\]
\[-a + 6 - 6 \leq 5 - 6\]
\[-a \leq -1\]
\[-\frac{a}{-1} \geq \frac{-1}{-1}\]
\[a \geq 1\]

The solution set is \(\{a \mid a \geq 1\}\).

17. \(37 < 7 - 10w\)

**SOLUTION:**

\[37 < 7 - 10w\]
\[37 - 7 < 7 - 7 - 10w\]
\[30 < -10w\]
\[\frac{30}{-10} > \frac{-10w}{-10}\]
\[-3 > w\]
\[w < -3\]

The solution set is \(\{w \mid w < -3\}\).

18. \(8 - \frac{z}{3} \geq 11\)

**SOLUTION:**

\[8 - \frac{z}{3} \geq 11\]
\[8 - 8 - \frac{z}{3} \geq 11 - 8\]
\[-\frac{z}{3} \geq 3\]
\[-3 \left(-\frac{z}{3}\right) \leq -3(3)\]
\[z \leq -9\]

The solution set is \(\{z \mid z \leq -9\}\).
5-3 Solving Multi-Step Inequalities

19. \(-\frac{5}{4} + 6 < 12\)

**SOLUTION:**
\[
\begin{align*}
-\frac{5}{4}p + 6 &< 12 \\
-\frac{5}{4}p + 6 - 6 &< 12 - 6 \\
-\frac{5}{4}p &< 6 \\
-4\left(-\frac{5}{4}p\right) &> -4\left(6\right) \\
p &> -\frac{24}{5}
\end{align*}
\]
The solution set is \( \{p \mid p > -\frac{24}{5}\} \).

20. \(3b - 6 \geq 15 + 24b\)

**SOLUTION:**
\[
\begin{align*}
3b - 6 &\geq 15 + 24b \\
3b - 3b - 6 &\geq 15 + 24b - 3b \\
-6 &\geq 15 + 21b \\
-6 - 15 &\geq 15 - 15 + 21b \\
-21 &\geq 21b \\
-\frac{21}{21} &\geq \frac{21b}{21} \\
-1 &\geq b
\end{align*}
\]
The solution set is \( \{b \mid b \leq -1\} \).
21. \(15h + 30 < 10h - 45\)

**SOLUTION:**

\[
\begin{align*}
15h + 30 &< 10h - 45 \\
15h - 10h + 30 &< 10h - 10h - 45 \\
5h + 30 &< -45 \\
5h + 30 - 30 &< -45 - 30 \\
5h &< -75 \\
\frac{5h}{5} &< \frac{-75}{5} \\
\h &< -15
\end{align*}
\]

The solution set is \(\{h | h < -15\}\).

---

Define a variable, write an inequality, and solve each problem. Check your solution.

22. Three fourths of a number decreased by nine is at least forty-two.

**SOLUTION:**

Let \(n\) = the number.

\[
\begin{align*}
\frac{3}{4}n - 9 &\geq 42 \\
\frac{3}{4}n - 9 + 9 &\geq 42 + 9 \\
\frac{3}{4}n &\geq 51 \\
\frac{4}{3} \left( \frac{3}{4}n \right) &\geq \frac{4}{3}(51) \\
n &\geq 68
\end{align*}
\]

The solution set is \(\{n | n \geq 68\}\). To check this answer, substitute a number greater than or equal to 68 into the original inequality. Let \(n = 72\).

\[
\begin{align*}
\frac{3}{4}n - 9 &\geq 42 \\
\frac{3}{4}(72) - 9 &\geq 42 \\
54 - 9 &\geq 42 \\
45 &\geq 42
\end{align*}
\]

So, the solution checks.
23. Two thirds of a number added to six is at least twenty-two.

**SOLUTION:**
Let \( n \) = the number.

\[
\frac{2}{3}n + 6 \geq 22
\]
\[
\frac{2}{3}n + 6 - 6 \geq 22 - 6
\]
\[
\frac{2}{3}n \geq 16
\]
\[
\frac{3}{2} \left( \frac{2}{3}n \right) \geq \frac{3}{2} (16)
\]
\[
n \geq 24
\]

The solution set is \( \{n \geq 24\} \). To check this answer, substitute a number greater than or equal to 24 into the original inequality. Let \( n = 24 \).

\[
\frac{2}{3}n + 6 \geq 22
\]
\[
\frac{2}{3} (24) + 6 \geq 22
\]
\[
16 + 6 \geq 22
\]
\[
22 \geq 22
\]

So, the solution checks.
24. Seven tenths of a number plus 14 is less than forty-nine.

**SOLUTION:**

Let $n$ = the number.

\[
\frac{7}{10}n + 14 < 49
\]

\[
\frac{7}{10}n + 14 - 14 < 49 - 14
\]

\[
\frac{7}{10}n < 35
\]

\[
\frac{10}{7} \left( \frac{7}{10}n \right) < \frac{10}{7} \left( 35 \right)
\]

\[
n < 50
\]

The solution set is \( \{ n | n < 50 \} \). To check this answer, substitute a number less than 50 into the original inequality. Let $n = 10$.

\[
\frac{7}{10}n + 14 < 49
\]

\[
\frac{7}{10}(10) + 14 < 49
\]

\[
7 + 14 < 49
\]

\[
21 < 49
\]

So, the solution checks.
25. Eight times a number minus twenty-seven is no more than the negative of that number plus eighteen.

**SOLUTION:**
Let $n$ = the number.

\[8n - 27 \leq -n + 18\]
\[8n + n - 27 \leq -n + n + 18\]
\[9n - 27 \leq 18\]
\[9n - 27 + 27 \leq 18 + 27\]
\[\frac{9n}{9} \leq \frac{45}{9}\]
\[n \leq 5\]

The solution set is \(\{n | n \leq 5\}\). To check this answer, substitute a number less than or equal to 5 into the original inequality. Let $n = 1$.

\[8n - 27 \leq -n + 18\]
\[8(1) - 27 \leq -1 + 18\]
\[8 - 27 \leq -1 + 18\]
\[-19 \leq 17\]

So, the solution checks.
26. Ten is no more than 4 times the sum of twice a number and three.

**SOLUTION:**

Let \( n \) = the number.

\[
\begin{align*}
10 & \leq 4(2n + 3) \\
10 & \leq 8n + 12 \\
10 - 12 & \leq 8n + 12 - 12 \\
-2 & \leq 8n \\
\frac{-2}{8} & \leq \frac{8n}{8} \\
\frac{-1}{4} & \leq n \\
\frac{n}{4} & \geq \frac{1}{4}
\end{align*}
\]

The solution set is \( \left\{ n \mid n \geq \frac{-1}{4} \right\} \).

To check this answer, substitute a number greater than or equal to \( \frac{-1}{4} \) into the original inequality. Let \( n = 1 \).

\[
\begin{align*}
10 & \leq 4(2(1) + 3) \\
10 & \leq 4[2(1) + 3] \\
10 & \leq 4(5) \\
10 & \leq 20
\end{align*}
\]

So, the solution checks.
27. Three times the sum of a number and seven is greater than five times the number less thirteen.

**SOLUTION:**
Let \( n \) = the number.

\[
3(n + 7) > 5n - 13 \\
3n + 21 > 5n - 13 \\
3n - 3n + 21 > 5n - 3n - 13 \\
21 > 2n - 13 \\
21 + 13 > 2n - 13 + 13 \\
34 > 2n \\
\frac{34}{2} > \frac{2n}{2} \\
17 > n \\
\quad n < 17
\]

The solution set is \( \{n | n < 17\} \).

To check this answer, substitute a number less than 17 into the original inequality. Let \( n = 1 \).

\[
3(n + 7) > 5n - 13 \\
3(1 + 7) > 5(1) - 13 \\
3(8) > 5 - 13 \\
24 > -8
\]

So, the solution checks.
28. The sum of nine times a number and fifteen is less than or equal to the sum of twenty-four and ten times the number.

**SOLUTION:**
Let \( n \) = the number.

\[
9n + 15 \leq 24 + 10n
\]

\[
9n - 9n + 15 \leq 24 + 10n - 9n
\]

\[
15 \leq 24 + n
\]

\[
15 - 24 \leq 24 - 24 + n
\]

\[
-9 \leq n
\]

\[
n \geq -9
\]

The solution set is \( \{n | n \geq -9\} \).
To check this answer, substitute a number greater than or equal to \(-9\) into the original inequality. Let \( n = -1 \).

\[
9(-1) + 15 \leq 24 + 10(-1)
\]

\[
-9 + 15 \leq 24 - 10
\]

\[
6 \leq 14
\]

So, the solution checks.
Solve each inequality. Check your solution.

29. \(-3(7n + 3) < 6n\)

**SOLUTION:**

\[
\begin{align*}
-3(7n + 3) &< 6n \\
-21n - 9 &< 6n \\
-21n + 21n - 9 &< 6n + 21n \\
-9 &< 27n \\
-9 &< 27n \\
\frac{-9}{27} &< \frac{27n}{27} \\
\frac{-1}{3} &< n \\
\Rightarrow n &> -\frac{1}{3}
\end{align*}
\]

The solution set is \(\{n \mid n > -\frac{1}{3}\}\).

To check this answer, substitute a number greater than \(-\frac{1}{3}\) into the original inequality. Let \(n = 1\).

\[
\begin{align*}
-3(7n + 3) &< 6n \\
-3[7(1) + 3] &< 6(1) \\
-3(7 + 3) &< 6 \\
-30 &< 6 \\
\end{align*}
\]

So, the solution checks.
5-3 Solving Multi-Step Inequalities

30. $21 \geq 3(a - 7) + 9$

**SOLUTION:**
\[
egin{align*}
21 & \geq 3(a - 7) + 9 \\
21 & \geq 3a - 21 + 9 \\
21 & \geq 3a - 12 \\
21 + 12 & \geq 3a - 12 + 12 \\
33 & \geq 3a \\
\frac{33}{3} & > \frac{3a}{3} \\
11 & \geq a \\
& a \leq 11
\end{align*}
\]

The solution set is \( \{a | a \leq 11\} \).
To check this answer, substitute a number less than or equal to 11 into the original inequality. Let \( n = 7 \).

\[
egin{align*}
21 & \geq 3(a - 7) + 9 \\
21 & \geq 3(7 - 7) + 9 \\
21 & \geq 3(0) + 9 \\
21 & \geq 9 \\
& \text{So, the solution checks.}
\end{align*}
\]

31. $2y + 4 > 2(3 + y)$

**SOLUTION:**
\[
egin{align*}
2y + 4 & > 2(3 + y) \\
2y + 4 & > 6 + 2y \\
2y - 2y + 4 & > 6 + 2y - 2y \\
4 & > 6
\end{align*}
\]

Since the inequality results in a false statement, the solution set is the empty set, \( \emptyset \).

32. $3(2 - b) < 10 - 3(b - 6)$

**SOLUTION:**
\[
egin{align*}
3(2 - b) & < 10 - 3(b - 6) \\
6 - 3b & < 10 - 3b + 18 \\
6 - 3b & < 28 - 3b \\
6 - 3b + 3b & < 28 - 3b + 3b \\
6 & < 28
\end{align*}
\]

Since all values of \( x \) make the inequality true, all real numbers are the solution. \( \{b | b \text{ is a real number}\} \)
33. $7 + t \leq 2(t + 3) + 2$

**SOLUTION:**

$7 + t \leq 2(t + 3) + 2$
$7 + t \leq 2t + 6 + 2$
$7 + t \leq 2t + 8$
$7 + t - t \leq 2t - t + 8$
$7 \leq t + 8$
$7 - 8 \leq t + 8 - 8$
$-1 \leq t$
$t \geq -1$

The solution set is \( \{t | t \geq -1\} \).

To check this answer, substitute a number greater than or equal to \(-1\) into the original inequality. Let \( t = 1 \).

$7 + t \leq 2(t + 3) + 2$
$7 + 1 \leq 2(1 + 3) + 2$
$8 \leq 2(4) + 2$
$8 \leq 10$

So, the solution checks.

34. $8a + 2(1 - 5a) \leq 20$

**SOLUTION:**

$8a + 2(1 - 5a) \leq 20$
$8a + 2 - 10a \leq 20$
$-2a + 2 \leq 20$
$-2a + 2 - 2 \leq 20 - 2$
$-2a \leq 18$
$\frac{-2a}{-2} \geq \frac{18}{-2}$
$a \geq -9$

The solution set is \( \{a | a \geq -9\} \).

To check this answer, substitute a number greater than or equal to \(-9\) into the original inequality. Let \( a = 1 \).

$8a + 2(1 - 5a) \leq 20$
$8(1) + 2[1 - 5(1)] \leq 20$
$8 + 2(-4) \leq 20$
$0 \leq 20$

So, the solution checks.
5-3 Solving Multi-Step Inequalities

Define a variable, write an inequality, and solve each problem. Then interpret your solution.

35. CARS  A car salesperson is paid a base salary of $35,000 a year plus 8% of sales. What are the sales needed to have an annual income greater than $65,000?

**SOLUTION:**
Let \( s \) = the amount of sales made.

\[
35,000 + 0.08s > 65,000
\]

\[
35,000 - 35,000 + 0.08s > 65,000 - 35,000
\]

\[
0.08s > 30,000
\]

\[
\frac{0.08s}{0.08} > \frac{30,000}{0.08}
\]

\[
s > 375,000
\]

The solution set is \( \{ s | s > 375,000 \} \). The amount of sales needed to have an annual income greater than $65,000 must be more than $375,000.

36. ANIMALS  Keith’s dog weighs 90 pounds. A healthy weight for his dog would be less than 75 pounds. If Keith’s dog can lose an average of 1.25 pounds per week on a certain diet, after how long will the dog reach a healthy weight?

**SOLUTION:**
Let \( w \) = the number of weeks.

\[
1.25w > 90 - 75
\]

\[
1.25w > 15
\]

\[
\frac{1.25w}{1.25} > \frac{15}{1.25}
\]

\[
w > 12
\]

The solution set is \( \{ w | w > 12 \} \). It will take more than 12 weeks for the dog to reach a healthy weight.

37. Solve \( 6(m - 3) > 5(2m + 4) \). Show each step and justify your work.

**SOLUTION:**

\[
\begin{align*}
6(m - 3) &> 5(2m + 4) & \text{Original inequality} \\
6m - 18 &> 10m + 20 & \text{Distributive Property} \\
6m - 18 - 6m &> 10m + 20 - 6m & \text{Subtract } 6m \text{ from each side.} \\
-18 &> 4m + 20 & \text{Simplify.} \\
-18 - 20 &> 4m + 20 - 20 & \text{Subtract 20 from each side.} \\
-38 &> 4m & \text{Simplify.} \\
\frac{-38}{4} &> \frac{4m}{4} & \text{Divide each side by 4.} \\
-9.5 &> m & \text{Simplify.}
\end{align*}
\]

The solution set is \( \{ m | m < -9.5 \} \).
38. Solve $8(a - 2) \leq 10(a + 2)$. Show each step and justify your work.

**SOLUTION:**

\[
\begin{align*}
8(a - 2) & \leq 10(a + 2) & \text{Original inequality} \\
8a - 16 & \leq 10a + 20 & \text{Distributive Property} \\
8a - 16 & - 8a \leq 10a + 20 - 8a & \text{Subtract 8a from each side.} \\
-16 & \leq 2a + 20 & \text{Simplify.} \\
-16 - 20 & \leq 2a + 20 - 20 & \text{Subtract 20 from each side.} \\
-36 & \leq 2a & \text{Simplify.} \\
-\frac{36}{2} & \leq \frac{2a}{2} & \text{Divide each side by 2.} \\
-18 & \leq a & \text{Simplify.} \\
\end{align*}
\]

The solution set is \{a \mid a \geq -18\}.

39. **MUSICAL**  A high school drama club is performing a musical to benefit a local charity. Tickets are $5 each. They also received donations of $565. They want to raise at least $1500.

a. Write an inequality that describes this situation. Then solve the inequality.

b. Graph the solution.

**SOLUTION:**

a. Let $t$ be the number of tickets that need to be sold.

\[
5t + 565 \geq 1500
\]

\[
\begin{align*}
5t + 565 - 565 & \geq 1500 - 565 \\
5t & \geq 935 \\
\frac{5t}{5} & \geq \frac{935}{5} \\
t & \geq 187
\end{align*}
\]

The solution set is \{t \mid t \geq 187\}.

b. 

\[\text{Graph showing inequality on a number line.}\]
5-3 Solving Multi-Step Inequalities

40. **ICE CREAM** Benito has $6 to spend. A sundae costs $3.25 plus $0.65 per topping. Write and solve an inequality to find how many toppings he can order.

**SOLUTION:**
Let \( t \) = the number of toppings Benito can order.

\[
\begin{align*}
3.25 + 0.65t & \leq 6 \\
3.25 - 3.25 + 0.65t & \leq 6 - 3.25 \\
0.65t & \leq 2.75 \\
\frac{0.65t}{0.65} & \leq \frac{2.75}{0.65} \\
t & \leq 4.23
\end{align*}
\]

Benito can order 4 or fewer toppings.

41. **SCIENCE** The normal body temperature of a camel is 97.7°F in the morning. If it has had no water by noon, its body temperature can be greater than 104°F.

a. Write an inequality that represents a camel’s body temperature at noon if the camel had no water.

b. If \( C \) represents degrees Celsius, then

\[
F = \frac{9}{5}C + 32
\]

Write and solve an inequality to find the camel’s body temperature at noon in degrees Celsius.

**SOLUTION:**

a. \( t > 104 \)

b. \[
\frac{9}{5}C + 32 > 104
\]

\[
\frac{9}{5}C + 32 - 32 > 104 - 32
\]

\[
\frac{9}{5}C > 72
\]

\[
\frac{5}{9} \left( \frac{9}{5}C \right) > \frac{5}{9}(72)
\]

\[C > 40\]

The camel’s body temperature at noon is greater than 40° C.

42. **NUMBER THEORY** Find all sets of three consecutive positive even integers with a sum no greater than 36.

**SOLUTION:**

\[
x + (x + 2) + (x + 4) \leq 36
\]

\[
3x + 6 \leq 36
\]

\[
3x + 6 - 6 \leq 36 - 6
\]

\[
3x \leq 30
\]

\[
\frac{3x}{3} \leq \frac{30}{3}
\]

\[x \leq 10\]

Create sets of 3 positive even integers that start with numbers less than or equal to 10.
2, 4, 6; 4, 6, 8; 6, 8, 10; 8, 10, 12; 10, 12, 14
5-3 Solving Multi-Step Inequalities

43. NUMBER THEORY  Find all sets of four consecutive positive odd integers whose sum is less than 42.

**SOLUTION:**
\[ x + (x + 2) + (x + 4) + (x + 6) < 42 \]
\[ 4x + 12 < 42 \]
\[ 4x + 12 - 12 < 42 - 12 \]
\[ 4x < 30 \]
\[ \frac{4x}{4} < \frac{30}{4} \]
\[ x < 7.5 \]

Create sets of 4 positive odd integers that start with numbers less than 7.5.
1, 3, 5, 7; 3, 5, 7, 9; 5, 7, 9, 11; 7, 9, 11, 13

**Solve each inequality. Check your solution.**

44. \(2(x - 4) \leq 2 + 3(x - 6)\)

**SOLUTION:**
\[ 2(x - 4) \leq 2 + 3(x - 6) \]
\[ 2x - 8 \leq 3x - 16 \]
\[ 2x - 2x - 8 \leq 3x - 2x - 16 \]
\[ -8 \leq x - 16 \]
\[ -8 + 16 \leq x - 16 + 16 \]
\[ 8 \leq x \]
\[ x \geq 8 \]

The solution set is \(\{x | x \geq 8\}\). To check this answer, substitute a number greater than or equal to 8 into the original inequality. Let \(x = 9\).

\[ 2(x - 4) \leq 2 + 3(x - 6) \]
\[ 2(9 - 4) \leq 2 + 3(9 - 6) \]
\[ 2(5) \leq 2 + 3(3) \]
\[ 10 \leq 11 \]

So, the solution checks.
45. \[ \frac{2x - 4}{6} \geq -5x + 2 \]

**SOLUTION:**

\[ \frac{2x - 4}{6} \geq -5x + 2 \]

\[ 6 \left( \frac{2x - 4}{6} \right) \geq 6(-5x + 2) \]

\[ 2x - 4 \geq -30x + 12 \]

\[ 2x + 30x - 4 \geq -30x + 30x + 12 \]

\[ 32x - 4 \geq 12 \]

\[ 32x - 4 + 4 \geq 12 + 4 \]

\[ 32x \geq 16 \]

\[ \frac{32x}{32} \geq \frac{16}{32} \]

\[ x \geq \frac{1}{2} \]

The solution set is \( \{ x \mid x \geq \frac{1}{2} \} \).

To check this answer, substitute a number greater than or equal to \( \frac{1}{2} \) into the original inequality. Let \( x = 5 \).

\[ \frac{2(5) - 4}{6} \geq -5(5) + 2 \]

\[ \frac{10 - 4}{6} \geq -25 + 2 \]

\[ 1 \geq -23 \]

So, the solution checks.
5.3 Solving Multi-Step Inequalities

46. \(5.6x + 1.5 < 2.5x - 4.7\)

**SOLUTION:**

\[
\begin{align*}
5.6x + 1.5 &< 2.5x - 4.7 \\
5.6x - 2.5x + 1.5 &< 2.5x - 2.5x - 4.7 \\
3.1x + 1.5 &< -4.7 - 1.5 \\
3.1x &< -6.2 \\
\frac{3.1x}{3.1} &< \frac{-6.2}{3.1} \\
x &< -2
\end{align*}
\]

The solution set is \(\{x | x < -2\}\).

To check this answer, substitute a number less than \(-2\) into the original inequality. Let \(x = -10\).

\[
\begin{align*}
5.6(-10) + 1.5 &< 2.5(-10) - 4.7 \\
-56 + 1.5 &< -25 - 4.7 \\
-54.5 &< -29.7
\end{align*}
\]

So, the solution checks.

47. \(0.7(2m - 5) \geq 21.7\)

**SOLUTION:**

\[
\begin{align*}
0.7(2m - 5) &\geq 21.7 \\
1.4m - 3.5 &\geq 21.7 \\
1.4m &\geq 25.2 \\
\frac{1.4m}{1.4} &\geq \frac{25.2}{1.4} \\
m &\geq 18
\end{align*}
\]

The solution set is \(\{m | m \geq 18\}\).

To check this answer, substitute a number greater than or equal to 18 into the original inequality. Let \(m = 20\).

\[
\begin{align*}
0.7(2m - 5) &\geq 21.7 \\
0.7[2(20) - 5] &\geq 21.7 \\
0.7(35) &\geq 21.7 \\
24.5 &\geq 21.7
\end{align*}
\]

So, the solution checks.
5-3 Solving Multi-Step Inequalities

**GRAPHING CALCULATOR** Use a graphing calculator to solve each inequality.

48. $3x + 7 > 4x + 9$

**SOLUTION:**
Use a graphing calculator to solve the inequality.
Let $Y_1 = 2x + 7$ and $Y_2 = 4x + 9$. Use the **intersect** function from the **CALC** menu to find the intersection of the two graphs.

At $x = -2$, $Y_1 = Y_2$ or $2x + 7 = 4x + 9$. When $x < -2$, $2x + 7 > 4x + 9$. Thus the solution set is $\{x | x < -2\}$.

49. $13x - 11 \leq 7x + 37$

**SOLUTION:**
Use a graphing calculator to solve the inequality.
Let $Y_1 = 13x - 11$ and $Y_2 = 7x + 37$. Use the **intersect** function from the **CALC** menu to find the intersection of the two graphs.

At $x = 8$, $Y_1 = Y_2$ or $13x - 11 = 7x + 37$. When $x \leq 8$, $13x - 11 \leq 7x + 37$. Thus the solution set is $\{x | x \leq 8\}$. 
5-3 Solving Multi-Step Inequalities

50. \(2(x - 3) < 3(x + 2)\)

**SOLUTION:**
Use a graphing calculator to solve the inequality.
Let \(Y_1 = 2(x - 3)\) and \(Y_2 = 3(x + 2)\). Use the intersect function from the \text{CALC} menu to find the intersection of the two graphs.

At \(x = -3\), \(Y_1 = Y_2\) or \(2(x - 3) = 3(x + 2)\). When \(x > -3\), \(2(x - 3) < 3(x + 2)\). Thus the solution set is \(\{x | x > -3\}\).

51. \(\frac{1}{2}x - 9 < 2x\)

**SOLUTION:**
Use a graphing calculator to solve the inequality.
Let \(Y_1 = \frac{1}{2}x - 9\) and \(Y_2 = 2x\). Use the intersect function from the \text{CALC} menu to find the intersection of the two graphs.

At \(x = -6\), \(Y_1 = Y_2\) or \(\frac{1}{2}x - 9 = 2x\). When \(x > -6\), \(\frac{1}{2}x - 9 < 2x\). Thus the solution set is \(\{x | x > -6\}\).
5-3 Solving Multi-Step Inequalities

52. \(2x - \frac{2}{3} \geq x - 22\)

**SOLUTION:**
Use a graphing calculator to solve the inequality.

\(2x - \frac{2}{3} \geq x - 22\)

Let \(Y1 = 2x - \frac{2}{3}\) and \(Y2 = x - 22\). Use the **intersect** function from the **CALC** menu to find the intersection of the two graphs.

![Graph showing the intersection of two graphs](image)

At \(x = \frac{64}{3}\), \(Y1 = Y2\) or \(2x - \frac{2}{3} \geq x - 22\). When \(x \geq -\frac{64}{3}\), \(2x - \frac{2}{3} \geq x - 22\). Thus the solution set is \(\{x \mid x \geq -\frac{64}{3}\}\).

53. \(\frac{1}{3} (4x + 3) \geq \frac{2}{3} x + 2\)

**SOLUTION:**
Use a graphing calculator to solve the inequality.

Let \(Y1 = \frac{1}{3} (4x + 3)\) and \(Y2 = \frac{2}{3} x + 2\).

Use the **intersect** function from the **CALC** menu to find the intersection of the two graphs.

![Graph showing the intersection of two graphs](image)

At \(x = 1.5\), \(Y1 = Y2\) or \(\frac{1}{3} (4x + 3) = \frac{2}{3} x + 2\). When \(x \geq 1.5\), \(\frac{1}{3} (4x + 3) \geq \frac{2}{3} x + 2\). Thus the solution set is \(\{x \mid x \geq 1.5\}\).
**5-3 Solving Multi-Step Inequalities**

54. **MULTIPLE REPRESENTATIONS** In this problem, you will solve compound inequalities. A number $x$ is greater than 4, and the same number is less than 9.

a. **NUMERICAL** Write two separate inequalities for the statement.

b. **GRAPHICAL** Graph the solution set for the first inequality in red. Graph the solution set for the second inequality in blue. Highlight the portion of the graph in which the red and blue overlap.

c. **TABULAR** Make a table using ten points from your number line, including points from each section. Use one column for each inequality and a third column titled “Both are True.” Complete the table by writing true or false.

d. **VERBAL** Describe the relationship between the colored regions of the graph and the chart.

e. **LOGICAL** Make a prediction of what the graph of $4 < x < 9$ looks like.

**SOLUTION:**

a. $x > 4; x < 9$

b. 

c. 

<table>
<thead>
<tr>
<th>Point</th>
<th>$x &gt; 4$</th>
<th>$x &lt; 9$</th>
<th>Both are True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>false</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>2</td>
<td>false</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>3</td>
<td>false</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>4</td>
<td>false</td>
<td>true</td>
<td>false</td>
</tr>
<tr>
<td>5</td>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>6</td>
<td>true</td>
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<td>true</td>
</tr>
<tr>
<td>7</td>
<td>true</td>
<td>true</td>
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<td>8</td>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>9</td>
<td>true</td>
<td>false</td>
<td>false</td>
</tr>
<tr>
<td>10</td>
<td>true</td>
<td>false</td>
<td>false</td>
</tr>
</tbody>
</table>

d. The points that make $x > 4$ a true statement are in the blue section. The points that make $x < 9$ a true statement are in the red section. The points that make both statements true are in the highlighted section.

e. The graph would be the highlighted section of the number line.

55. **REASONING** Explain how you could solve $-3p + 7 \geq -2$ without multiplying or dividing each side by a negative number.

**SOLUTION:**

Add $3p$ and 2 to each side. The inequality becomes $9 \geq 3p$. Then divide each side by 3 to get $3 \geq p$. 
5-3 Solving Multi-Step Inequalities

56. **CHALLENGE** If \( ax + b < ax + c \) is true for all values of \( x \), what will be the solution of \( ax + b > ax + c \)? Explain how you know.

**SOLUTION:**
The solution of \( ax + b > ax + c \) would be the empty set, \( \emptyset \). Subtracting \( ax \) from each side of \( ax + b < ax + c \) leaves \( b < c \). If the original inequality has infinitely many solutions, then \( b \) must be a real number that is less than \( c \). Subtracting \( ax \) from each side of the second inequality \( ax + b > ax + c \) leaves \( b > c \). If \( b \) is always less than \( c \), then this inequality has no solutions.

57. **CHALLENGE** Solve each inequality for \( x \). Assume that \( a > 0 \).
   a. \( ax + 4 \geq -ax - 5 \)
   b. \( 2 - ax < x \)
   c. \( \frac{-2}{a}x + 3 > -9 \)

**SOLUTION:**

a.
\[
ax + 4 \geq -ax - 5 \quad \text{Original inequality.}
\]
\[
ax + 4 + ax \geq -5 \quad \text{Add } ax \text{ to both sides.}
\]
\[
2ax + 4 \geq -5 \quad \text{Simplify.}
\]
\[
2ax \geq -9 \quad \text{Subtract 4 from each side.}
\]
\[
\frac{2ax}{2a} \geq \frac{-9}{2a} \quad \text{Divide each side by } 2a.
\]
\[
x \geq \frac{-9}{2a} \quad \text{Simplify.}
\]

b.
\[
2 - ax < x \quad \text{Original inequality.}
\]
\[
2 < x + ax \quad \text{Add } ax \text{ to each side.}
\]
\[
2 < (1 + a)x \quad \text{Distributive Property}
\]
\[
\frac{2}{1+a} < \frac{(1+a)x}{1+a} \quad \text{Divide each side by } (1+a).
\]
\[
\frac{2}{1+a} < x \quad \text{Divide each side by } 2a.
\]
\[
x < \frac{9}{2a} \quad \text{Simplify.}
\]

c.
\[
\frac{-2}{a}x + 3 > -9 \quad \text{Original inequality.}
\]
\[
\frac{-2}{a}x \geq -12 \quad \text{Subtract 3 from each side.}
\]
\[
\frac{-a}{2} \left( \frac{-2}{a}x \right) < \frac{-a}{2}(-12) \quad \text{Multiply each side by } \frac{-a}{2}
\]
\[
x < 6a \quad \text{Reverse the inequality symbol.}
\]
\[
x < 6a \quad \text{Simplify.}
\]
5-3 Solving Multi-Step Inequalities

58. WHICH ONE DOESN’T BELONG? Name the inequality that does not belong. Explain.

\[
\begin{align*}
4y + 9 &> -3 \\
3y - 4 &> 5 \\
-2y + 1 &< -5 \\
-5y + 2 &< -13 \\
\end{align*}
\]

**SOLUTION:**

\[
\begin{align*}
4y + 9 &> -3 \\
4y + 9 - 9 &> -3 - 9 \\
4y &> -12 \\
\frac{4y}{4} &> \frac{-12}{4} \\
y &> -3
\end{align*}
\]

4y + 9 > -3 does not belong. It is the only inequality that does not have a solution set of \( \{ y \mid y > 3 \} \).

59. WRITING IN MATH Explain when the solution set of an inequality will be the empty set or the set of all real numbers. Show an example of each.

**SOLUTION:**

Sample answer: The solution set for an inequality that results in a false statement is the empty set, as in \( 12 < -15 \).

The solution set for an inequality in which any value of \( x \) results in a true statement is all real numbers, as in \( 12 \leq 12 \).
5-3 Solving Multi-Step Inequalities

60. What is the solution set of the inequality \(4t + 2 < 8t - (6t - 10)\)?
   A \(\{t \mid t < -6.5\}\)
   B \(\{t \mid t > -6.5\}\)
   C \(\{t \mid t < 4\}\)
   D \(\{t \mid t > 4\}\)

**SOLUTION:**
\[
\begin{align*}
4t + 2 &< 8t - (6t - 10) \\
4t + 2 &< 2t + 10 \\
4t - 2t + 2 &< 2t - 2t + 10 \\
2t + 2 &< 10 \\
2t + 2 - 2 &< 10 - 2 \\
2t &< 8 \\
\frac{2t}{2} &< \frac{8}{2} \\
t &< 4
\end{align*}
\]

The solution set is \(\{t \mid t < 4\}\), so the correct choice is C.

61. **GEOMETRY** The section of Liberty Ave. between 5th St. and King Ave. is temporarily closed. Traffic is being detoured right on 5th St., left on King Ave. and then back on Liberty Ave. How long is the closed section of Liberty Ave.?

![Diagram of Liberty Ave., 5th St., and King Ave.]

   F 100 ft   
   G 120 ft   
   H 144 ft   
   J 180 ft

**SOLUTION:**
\[
\begin{align*}
da^2 + db^2 &= c^2 \\
72^2 + 9d^2 &= c^2 \\
5184 + 9d^2 &= c^2 \\
14,400 &= c^2 \\
\sqrt{14,400} &= \sqrt{c^2} \\
120 &= c
\end{align*}
\]

The closed section of Liberty Ave. is 120 feet, so the correct choice is G.
5-3 Solving Multi-Step Inequalities

62. SHORT RESPONSE  Rhiannon is paid $52 for working 4 hours. At this rate, how many hours will it take her to earn $845?

SOLUTION:
Find the rate.
\[52 = 4r\]
\[\frac{52}{4} = \frac{4r}{4}\]
\[13 = r\]

Solve for the number of hours using \( r = 13 \).
\[13h = 845\]
\[\frac{13h}{13} = \frac{845}{13}\]
\[h = 65\]

It will take Rhiannon 65 hours of work to earn $845.

63. GEOMETRY  Classify the triangle.

\[\text{A right}\]
\[\text{B parallel}\]
\[\text{C obtuse}\]
\[\text{D equilateral}\]

SOLUTION:
All three sides of the triangle are equal in length, so it is equilateral. The correct choice is D.
5-3 Solving Multi-Step Inequalities

Solve each inequality. Check your solution. (Lesson 5-2)

64. \( \frac{y}{2} \leq -5 \)

SOLUTION:

\[
\frac{y}{2} \leq -5 \\
2 \left( \frac{y}{2} \right) \leq 2(-5) \\
y \leq -10
\]

The solution set is \( \{y \mid y \leq -10\} \).

To check this answer, substitute a number less than or equal to \(-10\) into the original inequality. Let \(y = -30\).

\[
\frac{y}{2} \leq -5 \\
\frac{-30}{2} \leq -5 \\
-15 \leq -5
\]

So, the solution checks.

65. \( 12b > -48 \)

SOLUTION:

\[
12b > -48 \\
\frac{12b}{12} > \frac{-48}{12} \\
b > -4
\]

The solution set is \( \{b \mid b > -4\} \).

To check this answer, substitute a number greater than \(-4\) into the original inequality. Let \(b = 0\).

\[
12b > -48 \\
12(0) > -48 \\
0 > -48
\]

So, the solution checks.
5-3 Solving Multi-Step Inequalities

66. \(-\frac{2}{3}t \leq -30\)

**SOLUTION:**

\(-\frac{2}{3}t \leq -30\)

\(-\frac{3}{2}(\frac{-2}{3}t) \geq -\frac{3}{2}(-30)\)

\(t \geq 45\)

The solution set is \(\{t \geq 45\}\).

To check this answer, substitute a number greater than or equal to 45 into the original inequality. Let \(t = 48\).

\(-\frac{2}{3}(48) \leq -30\)

\(-32 \leq -30\)

So, the solution checks.

Solve each inequality. Check your solution, and graph it on a number line.

67. \(6 - h > -8\)

**SOLUTION:**

\(6 - h > -8\)

\(6 - 6 - h > -8 - 6\)

\(-h > -14\)

\(\frac{-h}{-1} < \frac{-14}{-1}\)

\(h < 14\)

The solution set is \(\{h | h < 14\}\).

To check this answer, substitute a number less than 14 into the original inequality. Let \(h = 10\).

\(6 - 10 > -8\)

\(-4 > -8\)

So, the solution checks.
5-3 Solving Multi-Step Inequalities

68. \( p - 9 < 2 \)

**SOLUTION:**

\[
\begin{align*}
p - 9 &< 2 \\
p - 9 + 9 &< 2 + 9 \\
p &< 11
\end{align*}
\]

The solution set is \( \{ p \mid p < 11 \} \).

To check this answer, substitute a number less than 11 into the original inequality. Let \( p = 10 \).

\[
\begin{align*}
p - 9 &< 2 \\
10 - 9 &< 2 \\
1 &< 2
\end{align*}
\]

So, the solution checks.


69. \( 3 \geq 4 - m \)

**SOLUTION:**

\[
\begin{align*}
3 &\geq 4 - m \\
3 - 4 &\geq 4 - 4 - m \\
-1 &\geq -m \\
\frac{-1}{-1} &\leq \frac{-m}{-1} \\
1 &\leq m \\
m &\geq 1
\end{align*}
\]

The solution set is \( \{ m \mid m \geq 1 \} \).

To check this answer, substitute a number greater than or equal to 1 into the original inequality. Let \( m = 4 \).

\[
\begin{align*}
3 &\geq 4 - m \\
3 &\geq 4 - 4 \\
3 &\geq 0
\end{align*}
\]

So, the solution checks.
5-3 Solving Multi-Step Inequalities

Solve each equation by graphing. Verify your answer algebraically.
70. $2x - 7 = 4x + 9$

**SOLUTION:**

\[
2x - 7 = 4x + 9 \\
2x - 2x - 7 = 4x - 2x + 9 \\
-7 = 2x + 9 \\
-7 - 9 = 2x + 9 - 9 \\
-16 = 2x \\
-16 \div 2 = 2x \div 2 \\
-8 = x
\]

71. $5 + 3x = 7x - 11$

**SOLUTION:**

\[
5 + 3x = 7x - 11 \\
5 + 3x - 3x = 7x - 3x - 11 \\
5 = 4x - 11 \\
5 + 11 = 4x - 11 + 11 \\
16 = 4x \\
16 \div 4 = 4x \div 4 \\
4 = x
\]
5-3 Solving Multi-Step Inequalities

72. $2(x - 3) = 5x + 12$

**SOLUTION:**

\[
2(x - 3) = 5x + 12 \\
2x - 6 = 5x + 12 \\
2x - 2x - 6 = 5x - 2x + 12 \\
-6 = 3x + 12 \\
-6 - 12 = 3x + 12 - 12 \\
-18 = 3x \\
\frac{-18}{3} = \frac{3x}{3} \\
-6 = x
\]

73. **THEME PARKS** In a recent year, 70.9 million people visited the top 5 theme parks in North America. That represents an increase of about 1.14% in the number of visitors from the prior year. About how many people visited the top 5 theme parks in North America in the prior year?

**SOLUTION:**

\[
\frac{70.9 - f}{f} = \frac{1.4}{100} \\
(70.9 - f)100 = 1.4f \\
7090 - 100f = 1.14f \\
7090 - 100f + 100f = 1.14f + 100f \\
7090 = 101.14f \\
\frac{7090}{101.14} = \frac{101.14f}{101.14} \\
70.1 \approx f
\]

About 70.1 million people visited theme parks in North America in the previous year.
5-3 Solving Multi-Step Inequalities

If \( f(x) = 4x - 3 \) and \( g(x) = 2x^2 + 5 \), find each value.

74. \( f(-2) \)

**SOLUTION:**

\[
f(x) = 4x - 3 \\
f(-2) = 4(-2) - 3 \\
\quad = -8 - 3 \\
\quad = -11
\]

75. \( g(2) - 5 \)

**SOLUTION:**

\[
g(x) = 2x^2 + 5 \\
g(2) - 5 = [2(2)^2 + 5] - 5 \\
\quad = (8 + 5) - 5 \\
\quad = 13 - 5 \\
\quad = 8
\]

76. \( f(c + 3) \)

**SOLUTION:**

\[
f(x) = 4x - 3 \\
f(c + 3) = 4(c + 3) - 3 \\
\quad = 4c + 12 - 3 \\
\quad = 4c + 9
\]

77. **COSMETOLOGY** On average, a barber received a tip of $4 for each of 12 haircuts. Write and evaluate an expression to determine the total amount that she earned.

**SOLUTION:**

\[
12(29.95) + 12(4) = 359.40 + 48 \\
\quad = 407.40
\]

The total amount the hair stylist earned is $407.40.

**Graph each set of numbers on a number line.**

78. \( \{-4, -2, 2, 4\} \)

**SOLUTION:**

Draw a solid dot for each number in the set.

\[\begin{array}{cccccccccccc}
-5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
\end{array}\]
5-3 Solving Multi-Step Inequalities

79. \{-3, 0, 1, 5\}

**SOLUTION:**
Draw a solid dot for each number in the set.

```
-5 -4 -3 -2 -1 0 1 2 3 4 5
```

80. \{integers less than 3\}

**SOLUTION:**
Draw a solid dot for several representative numbers in the set.

```
-3 -2 -1 0 1 2 3 4 5 6 7 8
```

81. \{integers greater than or equal to \(-2\)\}

**SOLUTION:**
Draw a solid dot for several representative numbers in the set.

```
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3
```

82. \{integers between \(-3\) and 4\}

**SOLUTION:**
Draw a solid dot for each number in the set.

```
-5 -4 -3 -2 -1 0 1 2 3 4 5
```

83. \{integers less than \(-1\)\}

**SOLUTION:**
Draw a solid dot for several representative numbers in the set.

```
-6 -5 -4 -3 -2 -1 0 1 2 3 4 5
```