Before Class:

☐ Read the objectives on page 266.

☐ Read the Helpful Hint boxes on pages 267, 268, and 269.

☐ Complete the exercises:

1. What is the difference between a linear equation in one variable and a linear inequality in one variable?

2. To graph a linear inequality, use a(n) __________________________ for the inequalities < or > and use a(n) __________________________ for the inequalities ≤ or ≥.

3. What must be done to an inequality symbol whenever both sides of the inequality are multiplied or divided by a negative number?

During Class:

☐ Write your class notes. Neatly write down all examples shown as well as key terms or phrases with definitions. If not applicable or if you were absent, watch the Lecture Series (DVD) for this section and do the same (write down the examples shown as well as key terms or phrases). Insert more paper as needed.

<table>
<thead>
<tr>
<th>Class Notes/Examples</th>
<th>Your Notes</th>
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Answers: 1) Answers may vary. 2) open dot; closed dot 3) The inequality symbol must be reversed.
Section 4.1 Linear Inequalities and Problem Solving

Practice:

☐ Complete the Vocabulary and Readiness Check on page 272.

☐ Next, complete any incomplete exercises below. Check and correct your work using the answers and references at the end of this section.

Review this example:
1. Graph $x \geq -1$.
   
   We place a solid dot at $-1$ since the inequality symbol is $\geq$ and $-1$ is greater than or equal to $-1$. Then we shade to the right of $-1$.

   ![](image)

Your turn:
2. Graph the inequality on a number line: $x \leq -1$

Review this example:
3. Solve $x + 4 \leq -6$ for $x$. Graph the solutions.
   
   Subtract 4 from both sides of the inequality.
   
   $x + 4 \leq -6$
   $x + 4 - 4 \leq -6 - 4$
   $x \leq -10$

   ![](image)

Your turn:
4. Solve the inequality. Graph the solutions. $x - 2 \geq -7$

Review this example:
5. Solve $2(x - 3) - 5 \leq 3(x + 2) - 18$. Graph the solutions.
   
   $2(x - 3) - 5 \leq 3(x + 2) - 18$
   $2x - 6 - 5 \leq 3x + 6 - 18$
   $2x - 11 \leq 3x - 12$
   $-x - 11 \leq -12$
   $-x \leq -1$
   
   ![](image)

Your turn:
6. Solve: $-2(x - 4) - 3x \leq - (4x + 1) + 2x$
**Section 4.1 Linear Inequalities and Problem Solving**

**Review this example:**

7. Marie Chase and Jonathan Edwards are having their wedding reception at the Gallery Reception Hall. They may spend at most $2000 for the reception. If the reception hall charges a $100 cleanup fee plus $36 per person, find the greatest number of people that they can invite and still stay within their budget.

UNDERSTAND. Read and reread the problem. Let \( x \) = the number of people who attend the reception.

TRANSLATE.

\[
\text{Cleanup fee} + \text{cost/person} \quad \text{must be less} \quad \text{than or equal to} \quad \text{$2000}.
\]

\[
100 + 36x \leq 2000
\]

SOLVE.

\[
36x \leq 1900
\]

\[
x \leq 52\frac{7}{9}
\]

INTERPRET.

Since \( x \) represents the number of people, we round down to the nearest whole, or 52. Marie and Jonathan can invite at most \( 52 \) people to the reception.

**Your turn:**

8. Find the values for \( x \) so that the perimeter of this rectangle is no greater than 100 centimeters.

**Next, insert your homework.** Make sure you attempt all exercises asked of you and show all work, as in the exercises above. Check your answers if possible. Clearly mark any exercises you were unable to correctly complete so that you may ask questions later. DO NOT ERASE YOUR INCORRECT WORK. THIS IS HOW WE UNDERSTAND AND EXPLAIN TO YOU YOUR ERRORS.