

## 9.3 Solving Multi-Step Inequalities

*MathLinks 9, pages 360–367*

### Key Ideas Review

For #1 to 3, unscramble the letters to form a word that correctly completes the statement.

- To solve a multi-step inequality, \_\_\_\_\_ the variable in the same way that could be used to solve a(n) \_\_\_\_\_. Remember to \_\_\_\_\_ the inequality sign when \_\_\_\_\_ or \_\_\_\_\_ by a \_\_\_\_\_ number.  
 OTIAELS  
 TNQAEIOU  
 EEESVRR  
 IIUYPLGLMNT  
 NDDVGIII  
 AVEETING
- There are often several possible methods for solving a \_\_\_\_\_ – \_\_\_\_\_ inequality. The variable can be isolated on the \_\_\_\_\_ or the \_\_\_\_\_, depending on which is more convenient.  
 ILUMT  
 ETSP  
 FLET  
 GTRIH
- Problems that involve \_\_\_\_\_ different options can often be modelled and solved using \_\_\_\_\_.  
 GOMACRNPI  
 QETEANIIILUS

### Check Your Understanding

- Solve each inequality.
  - $3x + 7 < 34$
  - $\frac{x}{3} - 4 \geq -10$
  - $30 - 5x > 42$
  - $-22 \leq -10 + 8x$
- Solve.
  - $3x \geq 5x + 24$
  - $3x - 7 < 8x + 3$
  - $2.5(4 + 7x) + 3 \leq 5.5x - 17$
  - $3(8 - 3x) < 11 - 4(2x - 3)$

6. a) Verify whether  $x \leq 3$  is the solution to the inequality  $7x \geq 20x - 39$ . Show your work.

- b) Verify if  $x > 1$  is the solution to the inequality  $7 - 4x > -2(3x - 5)$ . Show your work.

- c) Verify whether  $x \leq 3\frac{2}{5}$  is the solution to the inequality  $9x - 13\frac{3}{5} < 5x$ . Show your work.

- d) Verify whether  $x < -4.7$  is the solution to the inequality  $2x > 5x + 14.1$ . Show your work.

7. Ethan can download music from Site A for a flat rate of \$29 per month plus \$0.80 per download. He can download music from Site B for \$17 per month plus \$1.19 per download. How many downloads make Site A the better deal?

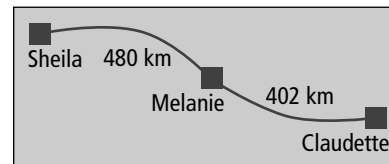
- a) Choose a variable and identify what it represents.
- b) Write an inequality to represent the situation.
- c) Solve the inequality and answer the question.

8. Trailways Bike Shop offers two options for renting bikes. How many hours would make the all-day plan the better deal?

**Hourly:** \$25 plus \$8 per hour

**All Day:** \$55

- a) Choose a variable and identify what it represents.
- b) Write an inequality to represent the problem.
- c) Determine the solution and use it to solve the problem.
9. Sheila, Melanie, and Claudette live in different towns, as shown on the map. Whenever they visit Melanie, Sheila and Claudette leave their houses at exactly the same time. Claudette always travels at 75 km/h.



- a) If Sheila travels at 105 km/h, use an inequality to determine after what amount of time she is closer to Melanie's house than Claudette is.
- b) How fast does Sheila have to travel so that she never arrives at Melanie's later than Claudette? Express your answer to the nearest tenth.