

# 6.7 Linear Inequalities in Two Variables



**MATERIALS** • set of tangram pieces • 4 tangram puzzles • stopwatch

**QUESTION** How can you use inequalities to describe an overestimate or an underestimate?

**EXPLORE** Conduct an experiment

To solve a tangram puzzle, you use seven pieces to create a figure. Each piece must lie flat and touch at least one other piece, and the pieces cannot overlap.

**STEP 1** Predict a time

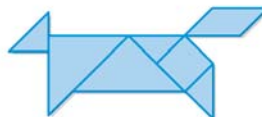
Have your partner give you a tangram puzzle, such as the dog shown below. Predict how long it will take you to create the figure.



Predicted time:  
50 seconds

**STEP 2** Create figure

Use the tangrams to create the figure. Your partner will use a stopwatch to record the actual time it takes you to finish.



Actual time:  
73 seconds

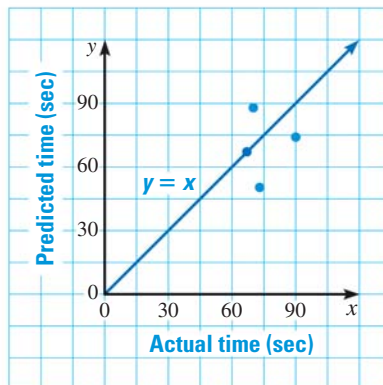
**STEP 3** Record times

Record the actual time  $x$  and the predicted time  $y$  in a table, as below. Repeat Steps 1–3 for three more puzzles. Then switch roles with your partner.

Figure	Actual time $x$ (sec)	Predicted time $y$ (sec)
1	73	50
2	67	67
3	70	88
4	90	74

**STEP 4** Plot points

Graph  $y = x$  in Quadrant I. Then plot the points  $(x, y)$  from the table.



**DRAW CONCLUSIONS** Use your observations to complete these exercises

- Describe the points that represent an *overestimate* of the actual finishing time. Then write an inequality that describes the location of the points in the coordinate plane.
- Describe the points that represent an *underestimate* of the actual finishing time. Then write an inequality that describes the location of the points in the coordinate plane.