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.
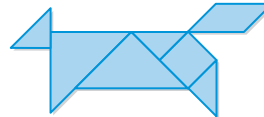
STEP 1 *Predict a time*

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.
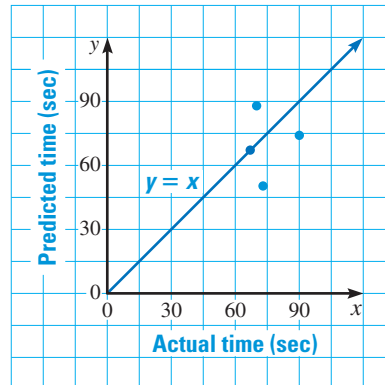
Actual time: 73 seconds

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

1. *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.

2. *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.