LESSON 4.6 Challenge Practice
For use with the lesson "Fit a Line to Data"

In Exercises 1 and 2, write a linear model for the data by finding the *median-median* line as explained in the steps below. Round your answers to the nearest hundredth.

In order to find a *median-median* line, follow these steps.

STEP 1: Order the points so the *x*-coordinate values are in increasing order.

STEP 2: Group the ordered data into three sets, each containing the same number of points. Find the median of the *x*-values and the median of the *y*-values for each set, starting with the set containing the smallest *x*-values. Write these medians as (x_1, y_1), (x_2, y_2), and (x_3, y_3).

STEP 3: Write an equation in the form $y = mx + b$ for the line passing through the points (x_1, y_1) and (x_3, y_3).

STEP 4: Use the values from Steps 2 and 3 to write an equation of the median-median line $y = mx + \frac{2}{3}b + \frac{1}{3}(y_2 - mx_2)$.

1. (2, 5), (4, 7), (5, 8), (7, 9), (8, 11), (10, 14), (13, 14), (14, 15), (16, 18), (18, 20), (19, 22), (19, 23)

2. (1, 4), (4, 3), (5, 6), (6, 9), (8, 10), (9, 12), (13, 14), (15, 14), (16, 15), (18, 16), (19, 18), (19, 20)

In Exercises 3-5, use the table that contains data on shoe size and height for 9 male high school seniors. Round your answers to the nearest hundredth.

Shoe Size	8.5	9.0	9.0	9.5	10.0	10.0	10.5	10.5	11.0
Height (in.)	66.0	68.5	67.5	70.0	70.0	72.0	71.5	69.5	71.5

3. Use the method of finding the *median-median* line to write a linear model for the relation between shoe size and height. Let *x* represent shoe size and *y* represent height.

4. Use the model found in Exercise 3 to estimate the height of a male high school senior with a shoe size of 9.0.

5. Use the model found in Exercise 3 to estimate the height of a male high school senior with a shoe size of 15.0.