LESSON 4.7 · Challenge Practice
For use with the lesson "Predict with Linear Models"

In Exercises 1–7, use the following information.

The relation between variables x and y is given in the table.

x	1	4	5	6	8	9	13	15	16	18	19	19
y	22	19	18	15	14	12	14	16	15	17	18	19

1. Make a scatter plot of the data in the table.

2. Find the line of best fit for the data for the first six points.

3. Find the line of best fit for the data for the last six points.

4. Using the model you found in Exercise 2, estimate the y-value when $x = 3$.

5. Using the model you found in Exercise 3, estimate the y-value when $x = 17$.

6. Using the model you found in Exercise 2, estimate the x-value when $y = 20$.

7. Using the model you found in Exercise 3, estimate the x-value when $y = 16$.

In Exercises 8–10, use the following information.

The populations of the U.S. and the world (in thousands of people) for the decades from 1950 to 2000 are given in the table.

Year	1950	1960	1970	1980	1990	2000
U.S.	152,271	180,671	205,052	227,726	250,132	282,339
World	2,556,517	3,040,966	3,708,751	4,452,646	5,282,766	6,081,528

8. Write a linear model to estimate the U.S. population y in the year t after year 1950. Then estimate the U.S. population in the year 1964.

9. Write a linear model to estimate the world population y in the year t after year 1950. Then estimate the world population in the year 1964.

10. Write a linear model that uses the U.S. population x to estimate the world population y in the years after 1950. Then use the estimated population of the U.S. in 1964 found in Exercise 8 to estimate the world population in 1964.

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