Confident Models

Let's explore our confidence in linear models.

7.1 Math Talk: Ordering Decimals

Mentally order the numbers from least to greatest.

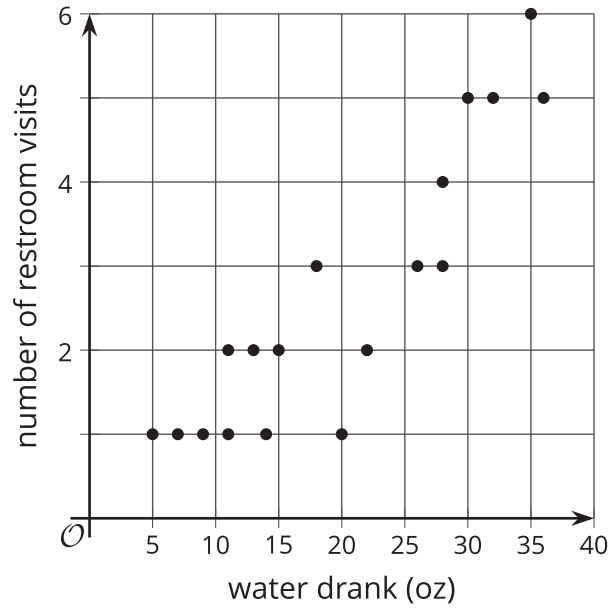
- 20.2, 18.2, 19.2
- -14.6, -16.7, -15.1
- -0.43, -0.87, -0.66
- 0.50, -0.52, 0.05

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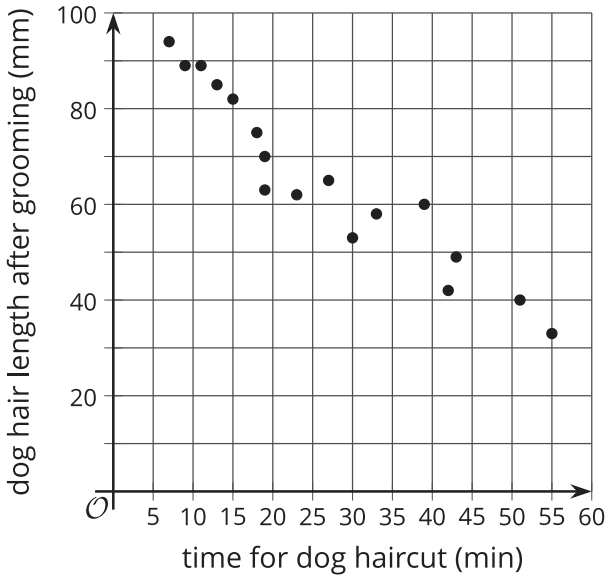
7.2 Ranking Models

1. Here are scatter plots that represent various situations. Order the scatter plots from "A linear model is not a good fit for the data" to "A linear model is an excellent fit for the data."

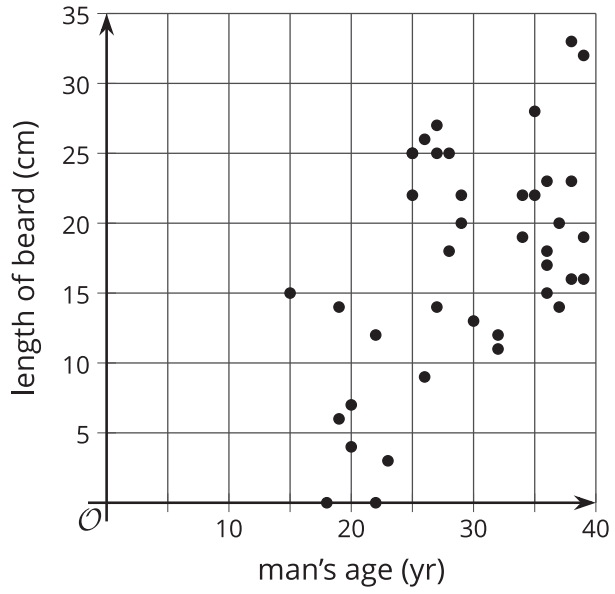
A



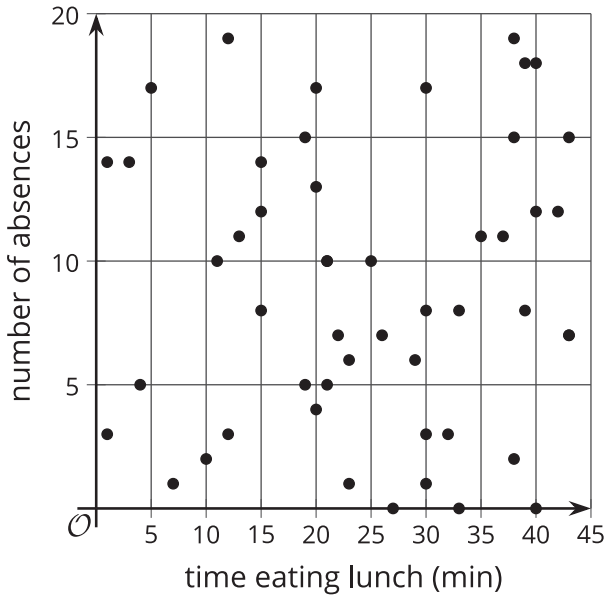
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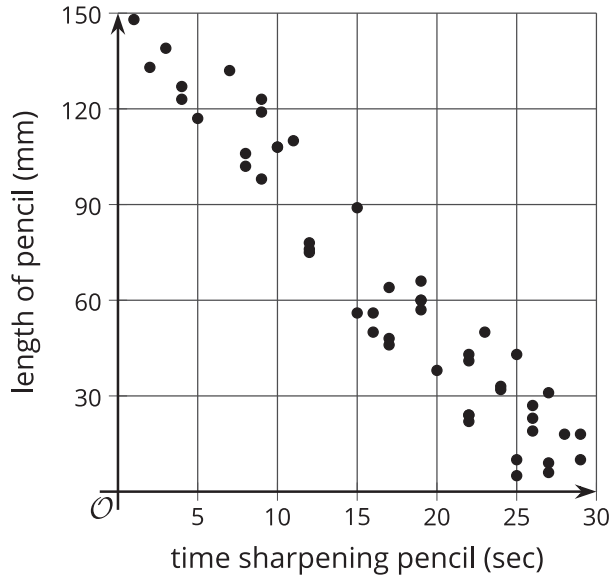
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D

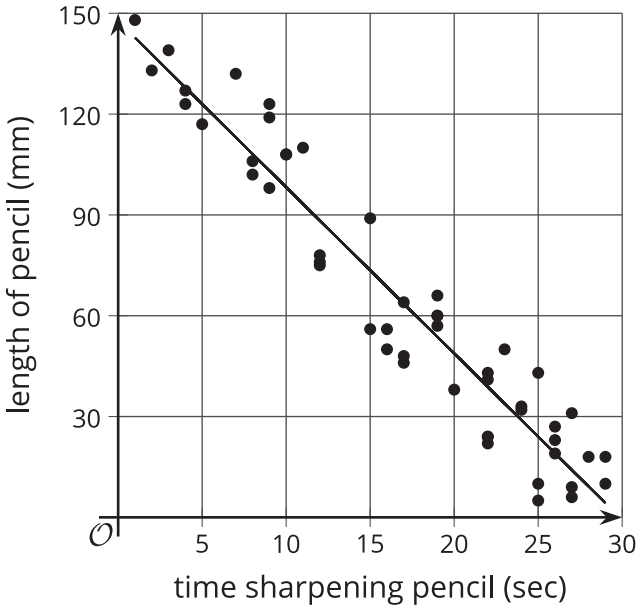


E

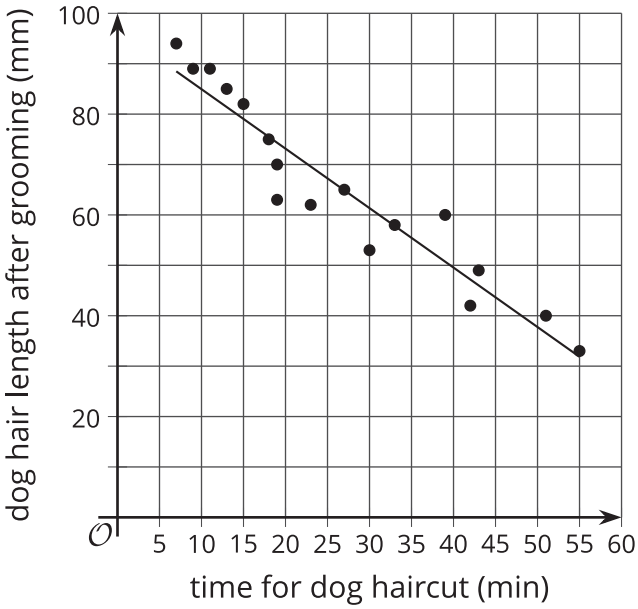


2. Here are two scatter plots including a linear model. For each model, determine the y when x is 15. Which model prediction do you think is closer to the real data? Explain your reasoning.

Graph F. $y = 150 - 5x$



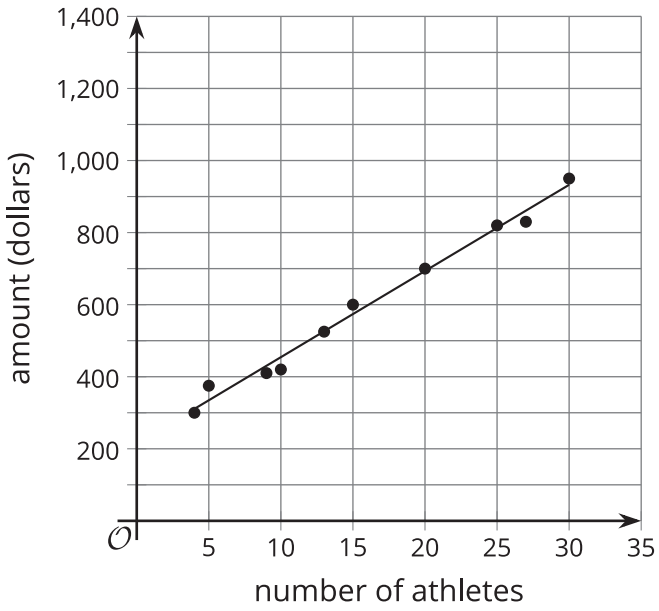
Graph G. $y = 97 - 1.2x$



7.3 Predicting Value

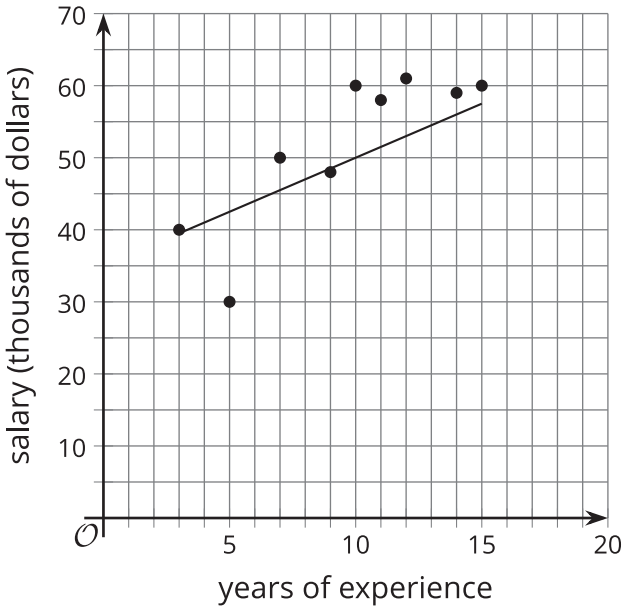
Here are situations represented with graphs and linear models of the data. Use the information given to complete the missing fields for each situation.

1. The model predicts how much money, in dollars, the coach will make based on how many athletes sign up for one-on-one training. The model is represented with the equation $y = 200 + 25x$.



   - The slope of the model is _____ (positive or negative).
   - What does the model predict would be the amount the coach makes when there are 10 athletes present?
   - Using the data points and the model as a reference, what is a reasonable range of money the coach will make when there are 10 athletes present?
   - This model is a _____ (great, good, okay, or bad) fit for the data.
   - Using numbers between 0 and 1, rate your confidence in the model where 0 is no confidence and 1 is total confidence.

2. The model predicts the annual salary of a worker in a certain government position based on years of experience. The model is represented with the equation $y = 1.5x + 35$.



- The slope of the model is _____ (positive or negative).

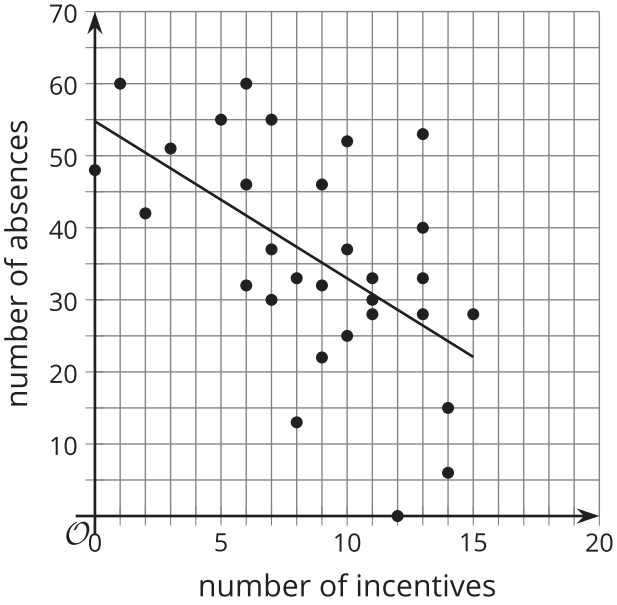
- What does the model predict would be the employee's salary when the employee has 10 years of experience?

- Using the data points and the model as a reference, what is a reasonable range for the salary of a worker based on 10 years of experience?

- This model is a _____ (great, good, okay, or bad) fit for the data.

- Using numbers between 0 and 1, rate your confidence in the model where 0 is no confidence and 1 is total confidence.

3. The model predicts the number of absences a school will have based on the number of incentives given per month. The model is represented with the equation $y = -2.18x + 54.78$.



- The slope of the model is _____ (positive or negative).
- What does the model predict would be the number of absences when 10 incentives are given for the month?
- Using the data points and the model as a reference, what is a reasonable number of absences when there are 10 incentives given?
- This model is a _____ (great, good, okay, or bad) fit for the data.
- Using numbers between 0 and 1, rate your confidence in the model where 0 is no confidence and 1 is total confidence.