Unit 3, Lesson 6

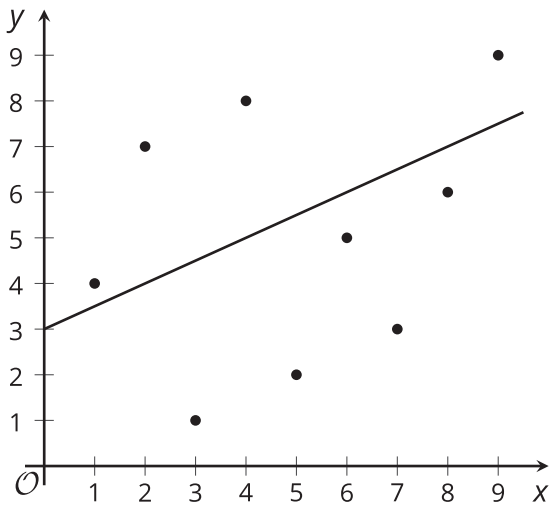
Actual Data vs. Predicted Data

Let's explore linear models that are fit to data.

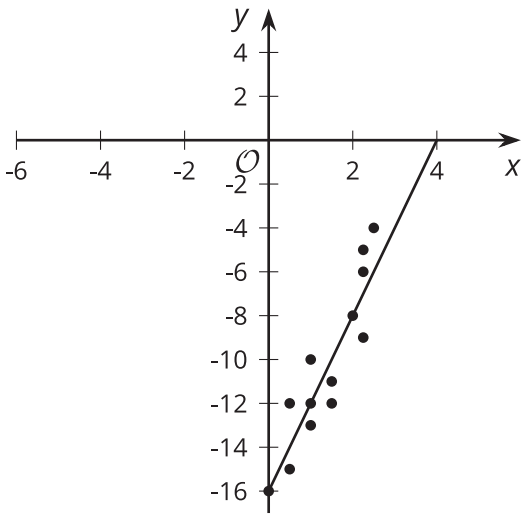
6.1 Which Three Go Together: Data Representations

Which three go together? Why do they go together?

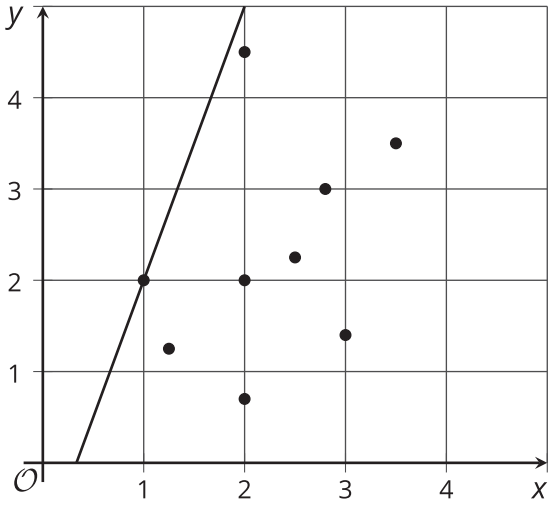
A



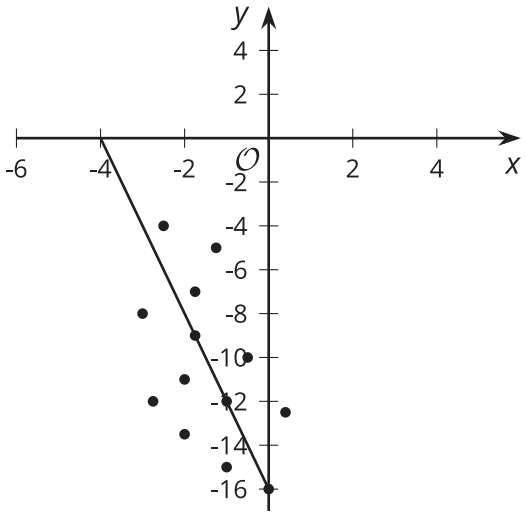
B



C

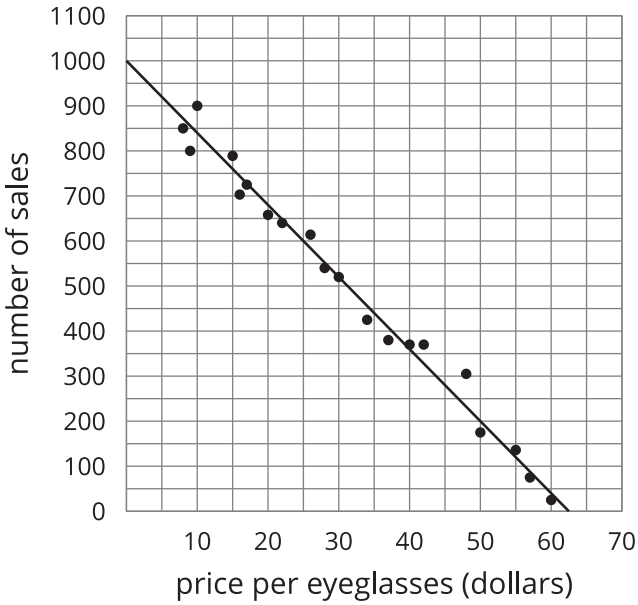


D



6.2 Predicting Sales

Here are a graph and a table showing the number of sales of eyeglasses based on the price in dollars. The model, represented by $y = 1{,}000 - 16x$, is graphed with a scatter plot. Use the graph and the table to answer the questions.



price per eyeglasses (dollars)	8	9	10	15	16	17	20	22	26	28
number of sales	850	800	900	789	703	725	658	640	614	540

price per eyeglasses (dollars)	30	34	37	40	42	48	50	55	57	60
number of sales	520	425	380	370	370	305	175	136	75	25

1. How many sales does the model estimate will be made when the eyeglasses are $50 each? Explain or show your reasoning.

2. How many sales were actually made when the eyeglasses were $50 each?

3. How many times did the model estimate fewer sales than what were actually made? List the coordinates.

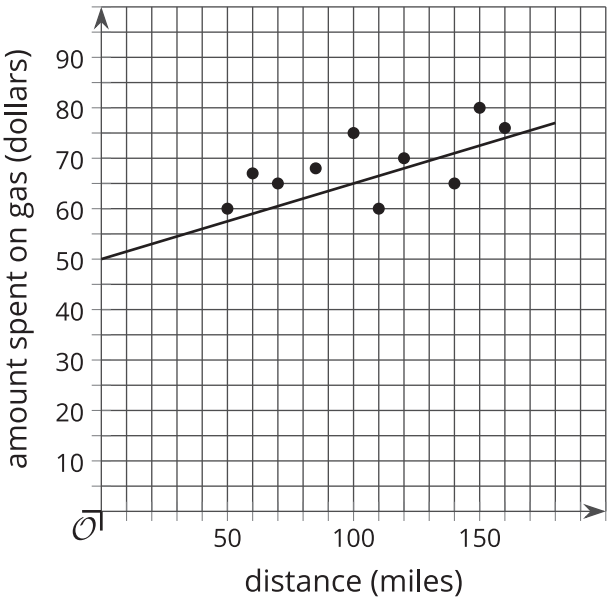
4. How many times were the predicted number of sales and actual number of sales equivalent? List the coordinates.

5. Find a point for which the model predicted there would be at least 25 more sales than were actually made.

6.3 Predictions

Priya's family keeps track of the number of miles on each trip they take over the summer and the amount spent on gas for the trip. The model, represented by $y = 50 + 0.15x$, is graphed with a scatter plot.

Use the graph and equation to complete the table. Then, use the graph, equation, and table to answer the questions.



distance (miles)	amount spent on gas (dollars)	estimated amount spent on gas (dollars)
50	60	
70	65	
100	75	
60	67	
110	60	
140	65	
80	68	
150	80	
160	76	

1. When Priya's family drove 85 miles, they spent $68 on gas. How much did they expect to spend based on the linear model?

2. How far had the family gone when they spent $80 on gas?

3. How far does the model estimate the family should have driven when they spent $80 on gas?

4. Are there any instances for which the model's estimated amount spent on gas is equivalent to the actual amount spent on gas?

5. Choose one option.
   - In general, the model predicts the family will spend more on gas than they actually spend.
   - In general, the model predicts the family will spend less on gas than they actually spend.