LearnZillion

**Interpret the Slope and Intercept Using a Linear Regression Line, Practice Set C**

Name:

Date:

1. The following data describe the relationship between the time (in hours) traveled and the distance (in miles) traveled.

| Time | 6 | 8 | 9.75 | 11 | 13 | 14 | 15.5 | 17 | 18.5 | 19.5 |
|---|---|---|---|---|---|---|---|---|---|---|
| Miles | 250 | 325 | 400 | 450 | 525 | 575 | 640 | 700 | 750 | 800 |

a. What is the least squares regression equation?

b. Interpret the slope of the least squares regression line.

c. Interpret the y-intercept of the least squares regression line.

d. If the person drove at a faster rate, how would it change the least squares regression equation?

2. The following describes the money (in $1 million) a movie makes in ticket sales after the initial release.

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Ticket Sales | 35.3 | 29.5 | 24.5 | 18.1 | 12.5 | 6.9 | 1.2 |

a. What is the least squares regression equation?

b. Interpret the slope of the least squares regression line. Be sure to include the units of the slope.

c. Interpret the y-intercept of the least squares regression line. Be sure to include the units of the y-intercept.

d. After the first two months of release, the international ticket sales come in to be counted. The movie company sees that each of the seven weeks had approximately $12.3 million in international sales. How do these ticket sales affect the least squares regression equation?

**Interpret the Slope and Intercept Using a Linear Regression Line, Practice Set C**
**Answer Key**

1. The following data describe the relationship between the time (in hours) traveled and the distance (in miles) traveled.

| Time | 6 | 8 | 9.75 | 11 | 13 | 14 | 15.5 | 17 | 18.5 | 19.5 |
|---|---|---|---|---|---|---|---|---|---|---|
| Miles | 250 | 325 | 400 | 450 | 525 | 575 | 640 | 700 | 750 | 800 |

a. What is the least squares regression equation?

The least squares regression equation is y = 40.8399 x + 1.3926

b. Interpret the slope of the least squares regression line.

For each 1 hour increase in time, we expect that, on average, the number of miles traveled will increase by 40.8399 miles. The unit for the slope is miles per hour.

c. Interpret the y-intercept of the least squares regression line.

If the time traveled is 0 hours, we expect that, on average, the number of miles traveled will be 1.3926 miles. There is not a practical interpretation for the y-intercept. The unit for the y-intercept is miles.

d. If the person drove at a faster rate, how would it change the least squares regression equation?

You notice that the slope of the regression line is 40.8399 miles per hour. If the person drove at a higher rate, then the slope of the regression line would increase, given all other factors being the same.

2. The following describes the money (in $1 million) a movie makes in ticket sales after the initial release.

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Ticket Sales | 35.3 | 29.5 | 24.5 | 18.1 | 12.5 | 6.9 | 1.2 |

a. What is the least squares regression equation?

The least squares regression equation is y = -5.6964 x + 41.0714.

b. Interpret the slope of the least squares regression line. Be sure to include the units of the slope.

For each additional week, we expect that, on average, the ticket sales decrease by $5.6964 million. The unit for the slope is $1 Million/Week.

c. Interpret the y-intercept of the least squares regression line. Be sure to include the units of the y-intercept.

If the week is zero, we expect that, on average, the ticket sales will be $41.0714.

*Discuss this with students. Is this possible? How? The company may be counting pre-sales.*

d. After the first two months of release, the international ticket sales come in to be counted. The movie company sees that each of the seven weeks had approximately $12.3 million in international sales. How do these ticket sales affect the least squares regression equation?

If $12.3 million is added to the ticket sales of each of the seven weeks, the slope would still be -5.5964. The y-intercept would be increased by 12.3 and would become 53.3714.