Section 3.4 The Line of Best Fit

1. Sketch the general appearance of a scatter plot associated with each value of the correlation coefficient.
   a) $r = 1$
   b) $r = 0.5$
   c) $r = -0.2$
   d) $r = -0.9$

2. Indicate whether the correlation coefficient would be positive, negative, or zero for each situation.
   Discuss and compare your answer with a partner.
   a) walking speed versus age
   b) number of hours sleeping versus number of years going to school
   c) number of hours working each day for a week, versus amount of money spent each day for a week
   d) number of cups of hot chocolate sold versus air temperature

3. Every year, Maggie gets two new model cars as a birthday present.

Year	Total Number of Model Cars
1992	2
1995	8
1999	16
2002	22
2006	30
2009	36

   a) Draw a scatter plot of the data on graph paper.
   b) Describe the relationship between the variables.
   c) Use algebra to determine the equation of the line of best fit.

4. While searching for a vacation, Sarah found an airline company that advertised its flight costs to various destinations.

Destination	Distance from Toronto (km)	Return Flight Cost ($)
New York City, USA	555	262.00
Orlando, USA	1692	320.00
Vancouver, Canada	3368	517.00
Madrid, Spain	6049	767.00
Paris, France	6015	869.00
Beijing, China	10 613	1294.00
Auckland, New Zealand	13 884	2306.00

   a) Make a scatter plot of the distance and cost for each destination.
   b) Use linear regression to model this relationship algebraically.
   c) How well does the regression equation fit the data? Explain.
   d) Give the slope and *y*-intercept, and interpret their meanings.
   e) Explain how Sarah could use the equation to choose a vacation. Include two examples.
   f) Assume the airline company uses a formula as a base for the flight cost calculations. What other factors might cause the flight cost to deviate from the calculated value?