7-103. Marissa’s older sister was discussing purchasing a car with her summer job earnings. Marissa collected data from her friends at her job.

a. Marissa would like to know the typical age of her friends’ cars. What kind of graphical display should she use? Why? **A box plot - it shows the spread and median of single variable data**

<table>
<thead>
<tr>
<th>Age of Car (years)</th>
<th>Avg. Miles per Gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
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<tr>
<td>5</td>
<td>30</td>
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<td>1</td>
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<td>9</td>
<td>27</td>
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<td>3</td>
<td>40</td>
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<tr>
<td>8</td>
<td>29</td>
</tr>
</tbody>
</table>

b. Marissa wants to convince her dad that newer cars are more fuel-efficient. What kind of graph(s) should Marissa make to convince her dad? Why?

**Scatterplot, shows the general relationship**

c. Make a scatterplot of the data.

d. Fully describe the association.

**Negative linear association with no outliers**

e. Draw a line of best fit on the data. Find the equation of the line of best fit. **Your equation should be similar to this: \( y = -0.7x + 36 \)**

f. Use the equation to predict what the correct mileage for a 7-year-old car should be.

**About 31 mpg**

g. Interpret the slope and \( y \)-intercept in this situation.

**A slope of negative \(-0.7\) means that for each additional year old a car is, we expect it to go 0.7 less miles per gallon; \( y \)-intercept of 36 means that a new car is predicted to go 36 mpg**
7-102. At a family reunion, each family member recorded his or her age and height on the scatterplot at the right.

a. Fully describe the association.

Positive linear association with no outliers

b. Draw the line of best fit on the scatterplot to the right. Does your y-intercept make sense in this problem situation?

Yes, a child of 0 years (just born) still has height—see video for further info on this problem

7-104. When Malcolm hops 10 times down the hallway, he travels 12 feet. How many times would he need to hop to travel to his class, 90 feet away? Explain your reasoning.

75 hops

7-105. Jeffrey and Liz are each saving money for college. Their savings are shown in the graph at right.

a. Based on the graph, who is saving money fastest? Justify your answer.

Liz is saving at a greater rate because her line is increasing faster (is steeper)

b. What is the slope of each line? What does the slope tell you about this situation?

Liz: 30, Jeffrey: 80/3. The slope tells you at what rate they each are saving

7-106. Simplify and solve the following equations.

a. \(3x + 4.5 = 4.5x - 18\)

\[x = 15\]

b. \(6.25x + 7.5 - 2.5x = 3.75x - 8.75\)

\[\text{no solution}\]