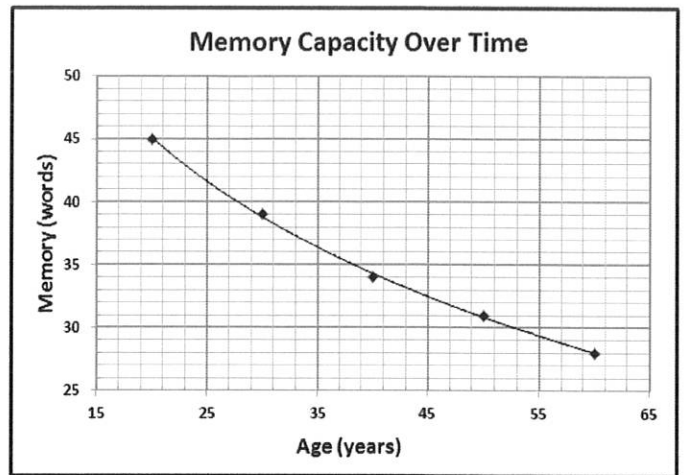


Mth 96 Chapter 5 Review

- Justify and show the means by which you arrive at your answers for full credit.
- Place a **box** around your final answer.
- Answers must be labeled for full credit.

1. Consider the data for memory strength as it decreases over life. Memory here is measured by how many words the person could recall from a reading test.

Age	Memory
20	45
30	39
40	34
50	31
60	28



- a. Find the **slope** between age 20 and 30 and explain its meaning in context in a complete sentence.

$$(20, 45) \quad (30, 39)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{39 - 45}{30 - 20} = \frac{-6}{10} = \boxed{-0.6}$$

Between age 20 and 30 the number of words they can recall goes down by 0.6 words

- b. Find the **slope** between age 40 and 50 and explain its meaning in context in a complete sentence.

$$(40, 34) \quad (50, 31)$$

$$m = \frac{31 - 34}{50 - 40} = \frac{-3}{10} = \boxed{-0.3}$$

Between age 40 and 50 the number of words they can recall goes down by 0.3 words.

- c. Use regression to find a **logarithmic** equation to model the data. Round the numbers in your equation to 2 decimal places.

$$y = a + b \ln x$$

$$a = 91.51885749$$

$$b = -15.50915031$$

$$y = 91.52 - 15.51 \ln x$$

- d. Use your equation to estimate the memory strength one should have at age 25.

Find y when $x = 25$

$$y = 91.52 - 15.51 \ln(25)$$

$$y = 41.59523594$$

$$y \approx 41.6 \text{ words}$$

At age 25 the number of words a person can recall is about 41.6.

- e. Use your equation to estimate the memory strength one should have at age 70.

Find y when $x = 70$

$$y = 91.52 - 15.51 \ln(70)$$

$$y = 25.6258388$$

$$y \approx 25.6$$

At age 70 the number of words a person can recall is about 25.6

- f. Use your equation to estimate the age a person would be when they can recall 36 words.

Find x when $y = 36$

$$36 = 91.52 - 15.51 \ln x$$

$$\frac{-91.52 - 91.52}{-91.52}$$

$$\frac{-55.52}{-15.51} = \frac{-15.51 \ln x}{-15.51}$$

$$7e^{3.579626048} = \ln x$$

$$35.86012836 = x$$

$$x \approx 35.9 \text{ years}$$

At age 35.9 the person can recall 36 words

- g. Use your equation to estimate the age a person would be when they can only recall 24 words.

Find x when $y = 24$

$$24 = 91.52 - 15.51 \ln x$$

$$\frac{-91.52 - 91.52}{-91.52}$$

$$\frac{-67.52}{-15.51} = \frac{-15.51 \ln x}{-15.51}$$

$$e^{4.353320438} = \ln x$$

$$77.73415298 = x$$

$$x \approx 77.7 \text{ years}$$

At age 77.7 the person can recall 24 words