**U.S. Women’s Life Expectancy**

The scatter plot below shows year number on the horizontal axis (x) and U.S. women’s life  
expectancy in years on the vertical axis (y).

Use the equation of the line of best fit (given below) to predict (to the nearest tenth) what the life expectancy will be for women in the U.S. in the

(a) year 2016 \_\_\_\_\_\_\_\_\_\_ (b) year 2020 \_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Year, x** | **Years, y** |
| 1900 | 49.1 |
| 1910 | 53.7 |
| 1920 | 56.3 |
| 1930 | 61.4 |
| 1940 | 65.3 |
| 1950 | 70.9 |
| 1960 | 73.2 |
| 1970 | 74.8 |
| 1980 | 77.5 |
| 1990 | 78.6 |
| 2000 | 79.0 |

(c)  is also given above. Use that value to calculate the correlation coefficient R to 4

decimal places.

\_\_\_\_\_\_\_\_\_

Then describe in a sentence the strength and type of the relationship between the two

variables.

(d) What is the slope of the line? \_\_\_\_\_\_\_\_\_\_

Now we’ll conduct a hypothesis test to see if y’ would be a better predictor than  (i.e., to see if there’s a significant relationship between x and y).

We set up the hypotheses in the typical format:

H0: ρ = 0

H1: ρ ≠ 0

H0 involves no significant relationship between the variables; H1 involves a significant relationship (either positive or negative).

(e) Use  = 0.05 and n = \_\_\_\_\_\_\_\_ for the sample size (df = \_\_\_\_\_ ), go to table A-5   
 and determine the critical values. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(f) Show the critical values on the graph below, and shade the rejection regions. Using   
  
 the r value, decide whether to reject or not reject the null hypothesis. \_\_\_\_\_\_\_\_\_\_\_\_\_

-1 0 1

(g) Explain your conclusion using the variables given in the problem.

(h) Based on your  value, \_\_\_\_\_\_\_\_\_ % of the variation of the life expectancy of U.S.   
 women (y) is explained by changes in the year (x).