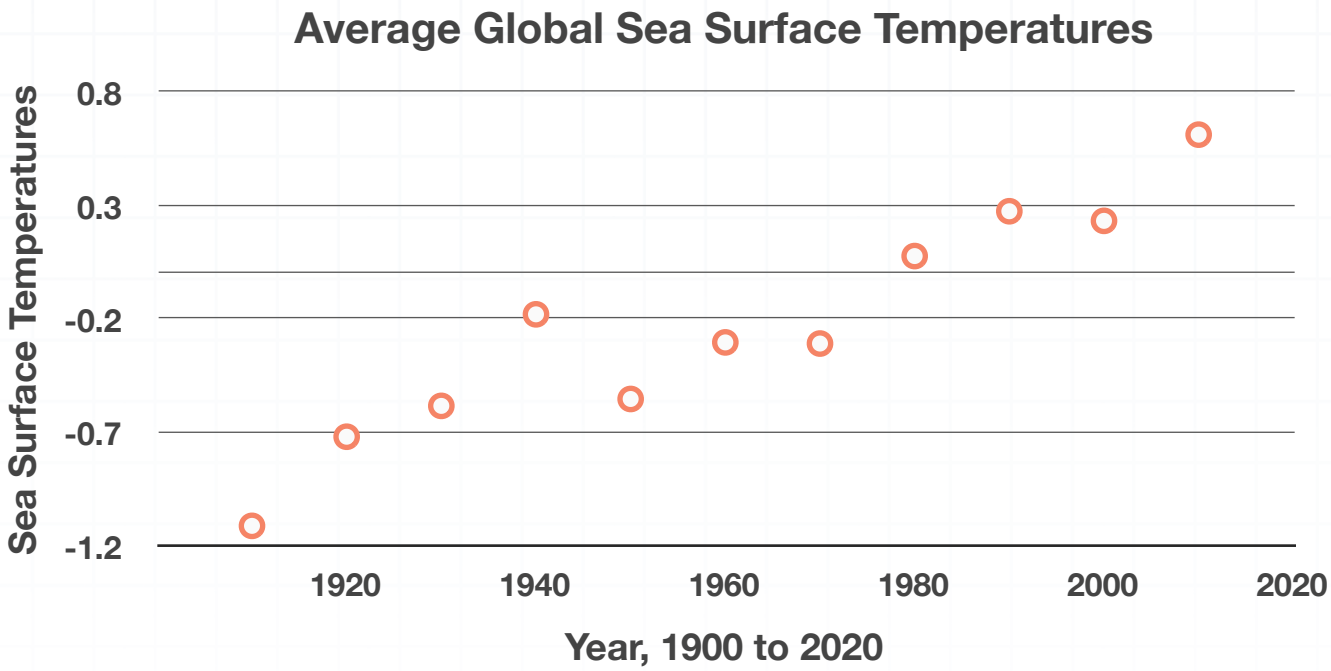
Topic: Scatterplots and regression

Question: Based on the scatterplot, which choice best explains the trend in the data?



Answer choices:

A There appears to be a strong, positive, linear relationship between sea surface temperatures and time.

B There appears to be a strong, negative, linear relationship between sea surface temperatures and time.

C There appears to be a weak, positive, linear relationship between sea surface temperatures and time.

D There appears to be a weak, negative, linear relationship between sea surface temperatures and time.

Solution: A

There appears to be a strong, positive, linear relationship between sea surface temperatures and time.

As time increases, the sea surface temperatures are also increasing. This means there's a positive relationship between time and temperature because as one goes up the other also goes up.

The points are relatively well clustered together so this implies a strong relationship. The section of the graph that we're looking at is linear in nature since the points trend upward from left to right.

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Question: Use the table to find the sum.

$$\sum xy$$

x	54	57	62	77	81	93	98
y	0.162	0.127	0.864	0.895	0.943	1.206	1.372

Answer choices:

A $\sum xy = 522$

B $\sum xy = 5.569$

C $\sum xy = 461.467$

D $\sum xy = 2{,}907.018$

Solution: C

The sum tells us to multiply each x-value by its corresponding y-value and then add those together.

x	y	xy
54	0.162	54(0.162)=8.748
57	0.127	57(0.127)=7.239
62	0.864	62(0.864)=53.568
77	0.895	77(0.895)=68.915
81	0.943	81(0.943)=76.386
93	1.206	93(1.206)=112.158
98	1.372	98(1.372)=134.456

Now add to find the sum.

$$\sum xy = 8.748 + 7.239 + 53.568 + 68.915 + 76.386 + 112.158 + 134.456$$

$$\sum xy = 461.467$$

Topic: Scatterplots and regression

Question: Corrina is conducting a study of how sleep and GPA are related. She surveys the students in her statistics class and creates a table comparing hours of sleep to GPA. Then she calculates the trend line of the data to be $y = 0.2069x + 1.817$. What is the correct interpretation of the slope of the trend line of the data?

Sleep	4	4.2	5	6.5	7	7.6	8.1	8.2	8.4	8.5	9	9.5
GPA	2.5	2.7	3	3.2	3.3	3.4	3.5	3.4	3.5	3.5	3.9	3.7

Answer choices:

A For each additional hour of sleep, GPA decreased by 1.817 points.

B For each additional hour of sleep, GPA decreased by 0.2069 points.

C For each additional hour of sleep, GPA increased by 1.817 points.

D For each additional hour of sleep, GPA increased by 0.2069 points.

Solution: D

The slope is the change in the y-values divided by the change in the x-values. In the case of this data, the y-value is the GPA and the x-values are the hours of sleep.

This means the slope has units "GPA points per hour." This says that the interpretation of the slope of the best fit line is

> *"For each additional hour of sleep, GPA increased by* 0.2069 *points."*