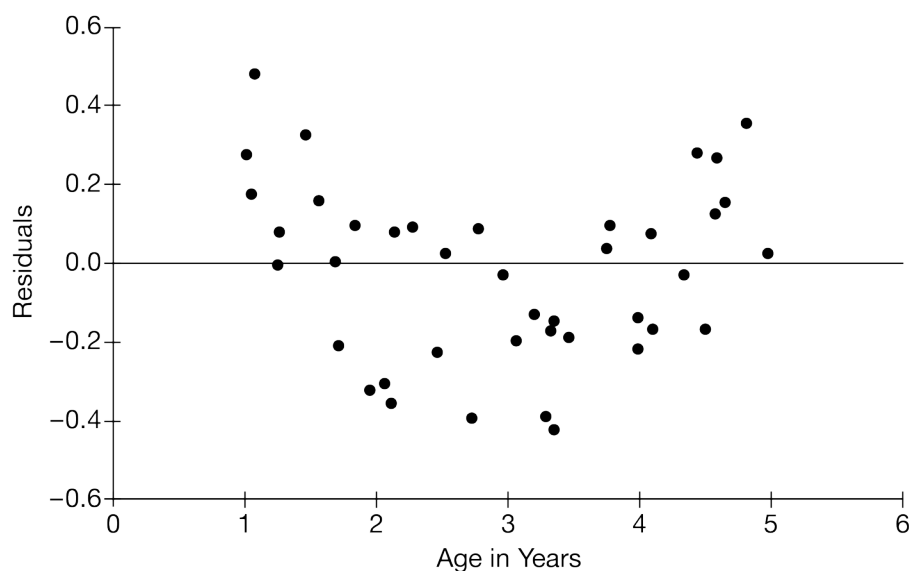


Residuals Quiz

1. A researcher collected data on the age, in years, and the growth of sea turtles. The following graph is a residual plot of the regression of growth versus age.



Does the residual plot support the appropriateness of a linear model?

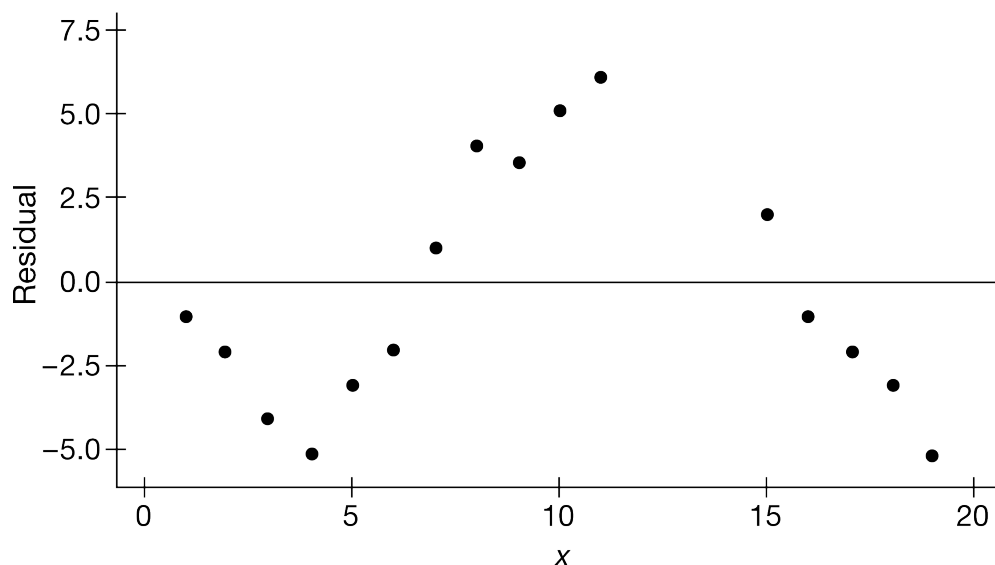
- (A) Yes, because there is a clear pattern displayed in the residual plot.
- (B) Yes, because about half the residuals are positive and the other half are negative.
- (C) Yes, because as age increases, the residuals increase.
- (D) No, because the points appear to be randomly distributed.
- (E) No, because the graph displays a U-shaped pattern. ✓

Answer E

Correct. A U-shaped pattern is evidence that a linear model is not appropriate.

Residuals Quiz

2. The following is a residual plot for a linear regression of y versus x .



What is indicated by the plot?

- (A) A linear model is appropriate.
- (B) A linear model is not appropriate. ✓
- (C) Variability in y is constant for all values x .
- (D) At least one point is influential with respect to the regression.
- (E) At least one point is an outlier with respect to the regression.

Answer B

Correct. The pattern in the plot indicates that the linear model is not appropriate.

3. An engineer believes that there is a linear relationship between the thickness of an air filter and the amount of particulate matter that gets through the filter; that is, less pollution should get through thicker filters. The engineer tests many filters of different thickness and fits a linear model. If a linear model is appropriate, what should be apparent in the residual plot?

Residuals Quiz

- (A) There should be a positive, linear association in the residual plot.
- (B) There should be a negative, linear association in the residual plot.
- (C) All of the points must have residuals of 0.
- (D) There should be no pattern in the residual plot. ✓
- (E) The residuals should have a small amount of variability for low values of the predictor variable and larger amounts of variability for high values of the predictor variable.

Answer D

Correct. Apparent randomness in a residual plot for a linear model is evidence of a linear association between the variables.