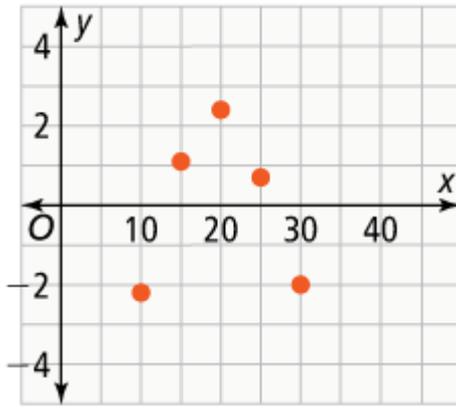


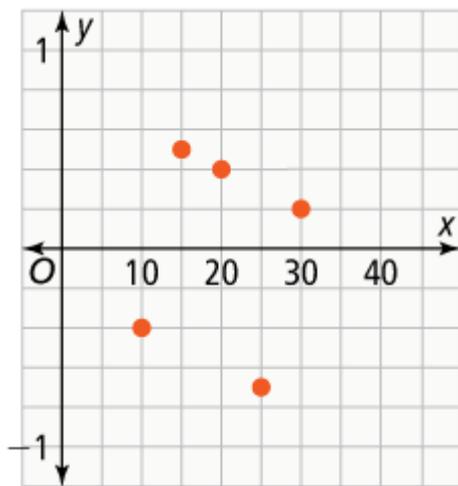
8. No; Answers may vary. Sample: By definition, data that have strong positive *correlation* have a strong linear relationship, so the correlation coefficient would not be as weak as 0.25. However, the data may have strong positive *association* and have a correlation coefficient of 0.25 because the best model might be nonlinear.
9. The student switched the order of the data. The student should enter x data in L1 and y data in L2 . The line of best fit is $y = 3.94x - 6.86$.
10. Interpolation; Answers may vary. Sample: Because interpolation is making a prediction within a known range of data, it is more likely that this data will fit the pattern already observed. Extrapolation is riskier because the pattern may not continue beyond the known range of data.
11. Answers may vary. Sample: In general, the slope of a linear model represents how the two types of data change in relation to one another. The y -intercept of a linear model represents the starting value, or when the independent variable has a value of 0.
12. Answers may vary. Sample: Locate the point on the graph that has the x -coordinate you are using to make the prediction. The y -coordinate of this point is the number you are trying to predict.
13. Tavon's model is better than Arthur's because the points on Tavon's residual plot are, on average, closer to the origin than the points on Arthur's residual plot.
14. The equation for the line of best fit is $y = 1.55x + 16.6$.
When $x = 19$, $y = 1.55(19) + 16.6 = 46.05$.
15. The equation for the line of best fit is $y = -5.73x + 197.2$. When $x = 19$,
 $y = -5.73(19) + 197.2 = 88.33$.
16. strong negative correlation
17. strong positive correlation
18. weak positive correlation
19. weak negative correlation

20.



The linear model is not a good fit for the data.

21.



The linear model is likely a good fit for the data.

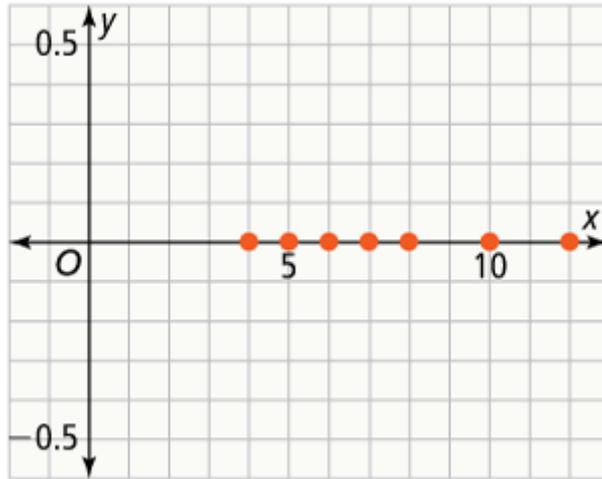
22. No, correlation does not necessarily mean causation. Causation describes a cause-and-effect relationship. A change in the one variable causes a change in the other variable. To determine whether the heating bills and the number of pets have a causal relationship, you have to carry out an experiment that can control for other variables that might influence the relationship between the heating bills and number of pets.
23. No, there will be exceptions.
24. Answers may vary. Sample: The temperature increases and then decreases as the time after midnight increases. A linear model would not be a good fit because a linear model is best for data that have a constant rate of change, not for data that have a rate of change that is positive and then negative.

25. The slope represents the change in trillions of vehicle-miles traveled each year.

In 2007, people in the U.S. traveled about 2.881 trillion vehicle miles.

In 2022, people in the U.S. will travel about 3.601 trillion vehicle miles.

26.



Answers may vary. Sample: Because the residuals are all 0, the data are perfectly linear.

27. a. strong negative correlation
b. neither weak nor strong correlation
c. strong positive correlation
d. weak
28. C

29. Part A The equation for the line of best fit is $y = -2.9x + 7465.2$.

The correlation coefficient is $r \approx -0.83$.

Part B The equation for the line of best fit is $y = -6.42x + 14,347.64$.

The correlation coefficient is $r = -0.94$.

Part C The data from 1940–2010 have a stronger correlation than the data from

1940–2010; Answers may vary. Sample: The correlation coefficient of the data

from 1940–2010 is closer to -1 than the correlation coefficient of the data from

1940–1980, so the data from 1940–2010 have a stronger linear relationship

than the data from 1940–1980.