

Scatterplots Answer Key

1. **B.** The scatterplot displays a linear trend, so we can model the data using a linear function of the form $y = mx + b$, where m is the slope of the line and $(0, b)$ is the y -intercept of the line. We can find b to be $(0, 30)$. We can also approximate two points that fall on the trend line $(0, 30)$ and $(15, 50)$, and use these to approximate the slope.

$$m = \frac{\Delta P}{\Delta t} = \frac{P_2 - P_1}{t_2 - t_1} = \frac{50 - 30}{15 - 0} = \frac{20}{15} = 1.33$$

Thus, the equation is $P = 0.67t + 30$. Choices A and D are incorrect because they have an incorrect slope value. Choice C is incorrect because it has an incorrect slope value and initial value.

2. **A.** Observing the line of best fit provided in the graph, we can see that the 60th day corresponds with a price of approximately \$3.95. Thus, \$4.00 is the best approximation for the price of 1 gallon of milk on March 1, 2017. Choices A, C, and D are all incorrect because they do not accurately approximate the price of milk on the 60th day of the year by using the curve of best fit provided.
3. **C.** The line has a positive slope, so choice B is incorrect. The line has a positive y -intercept, so choice A is incorrect. The line of best fit has a y -intercept at approximately 40, so choice D is incorrect. Thus, choice C is the best answer, and the equation that best models the population of wolves in Yellowstone is $W = 42.8 + 15.65t$. Choice A is incorrect because it has a negative initial value. Choice B is incorrect because it has a negative slope. Choice D is incorrect because its slope is clearly much less than the actual value.
4. **C.** Because x represents the number of years since 2009, and y represents the price of 1 gram of gold, the vertex point $(2.68, 1512.28)$ tells us that in the year $2009 + 2.68 = 2011.68$, the cost of 1 gram of gold was approximately \$1512.28. From the data, we can see that the vertex would be representing a maximum value, and not a minimum value. Thus, the vertex of the line of the quadratic model tells us that in approximately the year 2011, the price of 1 gram of gold reached its approximate maximum value of \$1512.28. Choices B and D are incorrect because the value of \$1512.28 is a maximum and not a minimum. Choice A is incorrect because such a sure conclusion cannot be made from the graph; a maximum value can only be approximated with the given data.
5. **B.** We can see that the line of best fit has a negative slope, so choices A and D are incorrect. The slope can be approximated by $m = \frac{15 - 3}{33 - 3} = \frac{12}{30} = 0.4$. The equation that best relates minutes on bench per game and points scored per game is $p = -0.4x + 16$.

Choices A and D are incorrect because they have a positive slope. Choice C is incorrect because it has an incorrect slope value.

6. **A.** Choice A is the only one with a strong positive association. Choice B has a negative association, choice C has a constant association, and choice D has a random association.

Choice B is incorrect because it shows a strong negative association. Choice C is incorrect because it shows a strong constant association. Choice D is incorrect because it shows a random association.

7. **B.** In the equation $y = ax^b$ where a is positive and b is positive, the graph has a positive y -intercept and rapidly increases away from the x -axis as x increases. Of the scatterplots shown, only choice B would appropriately model such a function. Choice A is incorrect because it shows a graph where a is positive and b is negative. Choice C is incorrect because it shows a graph where a and b are negative. Choice D is incorrect because it shows a graph where a is negative and b is positive.
8. **D.** If we draw a best fit quadratic function, we would observe that the quadratic function is concave down. Thus, in the quadratic equation of the form $y = ax^2 + bx + c$, a must be negative. Choices A and B are

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incorrect. We also see that the vertex is in the first quadrant, thus c must be positive. Choice B is incorrect. The correct model would be choice D, $y = -0.1553x^2 + 1.7992x + 75.183$. Choices A and C are incorrect because they describe positive quadratic equations. Choice D is incorrect because it has a negative C value and thus a vertex not in the first quadrant.

9. **C.** We are given the equation of line of best fit. To approximate the length of a maple leaf with a width of 7.8 centimeters, plug it into the equation to get $length = 0.7301(7.8) + 1.117 = 7.6$. Choices A, B, and D are incorrect because they do not give an accurate approximation of the length of a maple leaf with a width of 7.8 centimeters and may result from improper use of the line of best fit. Choice A results from plugging in 7.8 as y instead of as x .
10. **C.** Looking at the line of best fit, the percentage that corresponds with 13 days is approximately 78%. Choices A, B, and D are all incorrect because they do not give an accurate approximation of the percentage of clean kitty litter. Using the line of best fit, 78% is the best approximation for day 13.