1. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

   Pringles wants to add 42 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

   A. About 12 percent

   B. About 21 percent

   C. About 14 percent

   D. About 19 percent

   E. None of the above

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2. For the scenario below, find the variation constant k of the model (if possible).

   In an alternative galaxy, the square of the time, T (Earth years), required for a planet to orbit Sun χ decreases as the square of the distance, d (AUs), that the planet is from Sun χ decreases. For example, when Ea's average distance from Sun χ is 5, it takes 94 Earth days to complete an orbit.

   A. $k = 4.028$

   B. $k = 220900.000$

   C. $k = 4.336$

   D. $k = 353.440$

   E. Unable to compute the constant based on the information given.

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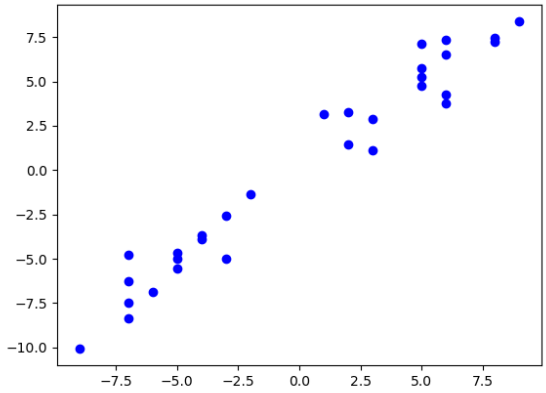
3. Determine the appropriate model for the graph of points below.



A. Exponential model

B. Logarithmic model

C. Non-linear Power model

D. Linear model

E. None of the above

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4. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 5 many cases reported, but the number of confirmed cases has tripled every 4 days. How long will it be until there are at least 1000000 confirmed cases?

A. About 22 days

B. About 21 days

C. About 49 days

D. About 45 days

E. There is not enough information to solve the problem.

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5. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 22 liter 20 percent solution of

chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 15 percent and 38 percent solutions, what was the amount she used of the 38 percent solution?

A. 7.03

B. 17.22

C. 4.78

D. 11.00

E. There is not enough information to solve the problem.

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6. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 22 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 10 percent

B. About 3 percent

C. About 11 percent

D. About 7 percent

E. None of the above

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7. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 26 liter 25 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 13 percent and 38 percent solutions, what was the amount she used of the 38 percent solution?

A. 13.52

B. 12.48

C. 12.00

D. 13.00

E. There is not enough information to solve the problem.

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8. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 5 many cases reported, but the number of confirmed cases has quadrupled every 2 days. How long will it be until there are at least 1000000 confirmed cases?

A. About 18 days

B. About 11 days

C. About 25 days

D. About 10 days

E. There is not enough information to solve the problem.

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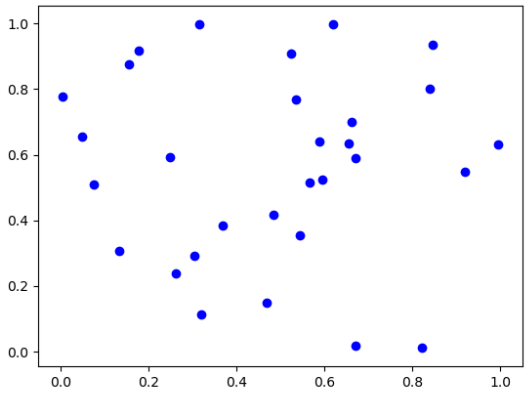
9. Determine the appropriate model for the graph of points below.



A. Non-linear Power model

B. Exponential model

C. Logarithmic model

D. Linear model

E. None of the above

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10. Using the situation below, construct a linear model that describes the cost of the coffee beans $C(h)$ in terms of the weight of the high-quality coffee beans h.

Veronica needs to prepare 190 of blended coffee beans selling for $3.67 per pound. She has a high-quality bean that sells for $4.43 a pound and a low-quality bean that sells for $2.95 a pound.

A. $C(h) = 3.69h$

B. $C(h) = 1.48h + 560.50$

C. $C(h) = -1.48h + 841.70$

D. $C(h) = 4.43h$

E. None of the above.
