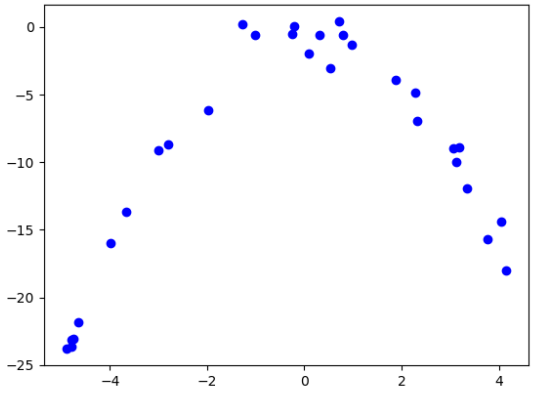
1. Determine the appropriate model for the graph of points below.



A. Non-linear Power model

B. Exponential model

C. Linear model

D. Logarithmic model

E. None of the above

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2. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 21 liter 23 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 18 percent and 44 percent solutions, what was the amount she used of the 44 percent solution?

A. 16.96

B. 4.04

C. 10.50

D. 15.32

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

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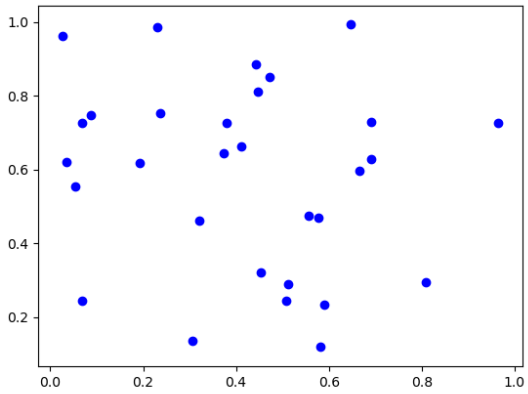
3. Determine the appropriate model for the graph of points below.



A. Non-linear Power model

B. Exponential model

C. Linear model

D. Logarithmic 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 8 many cases reported, but the number of confirmed cases has doubled every 4 days. How long will it be until there are at least 100000 confirmed cases?

A. About 55 days

B. About 17 days

C. About 38 days

D. About 15 days

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

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

   Pringles wants to add 46 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 21 percent

   B. About 23 percent

   C. About 13 percent

   D. About 4 percent

   E. None of the above

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6. Using the scenario below, model the situation using an exponential function and a base of $\frac{1}{2}$. Then, solve for the half-life of the element, rounding to the nearest day.

   The half-life of an element is the amount of time it takes for the element to decay to half of its initial starting amount. There is initially 736 grams of element X and after 11 years there is 184 grams remaining.

   A. About 730 days

   B. About 1825 days

   C. About 2555 days

   D. About 4380 days

   E. None of the above

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7. Solve the modeling problem below, if possible.

   In CHM2045L, Brittany created a 17 liter 24 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 19 percent and 30 percent solutions, what was the amount she used of the 19 percent solution?

A. 9.27

B. 7.73

C. 7.18

D. 8.50

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 4 many cases reported, but the number of confirmed cases has doubled every 2 days. How long will it be until there are at least 100000 confirmed cases?

A. About 12 days

B. About 21 days

C. About 30 days

D. About 10 days

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

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9. For the information below, construct a linear model that describes the total time T spent on the path in terms of the distance of a particular part of the path *if we know that the time spent on each path was equal.*

A bicyclist is training for a race on a hilly path. Their bike keeps track of their speed at any time, but not the distance traveled. Their speed traveling up a hill is 4 mph, 10 mph when traveling down a hill, and 6 mph when traveling along a flat portion.

A. $20.000D$

B. $0.517D$

C. $240.000D$

D. The model can be found with the information provided, but isn't options 1-3

E. The model cannot be found with the information provided.

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

Pringles wants to add 32 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 11 percent

B. About 16 percent

C. About 10 percent

D. About 15 percent

E. None of the above
