1. Solve the modeling problem below, if possible.

   A new virus is spreading throughout the world. There were initially 7 many cases reported, but the number of confirmed cases has doubled every 4 days. How long will it be until there are at least 1000000 confirmed cases?

   A. About 19 days

   B. About 48 days

   C. About 69 days

   D. About 21 days

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

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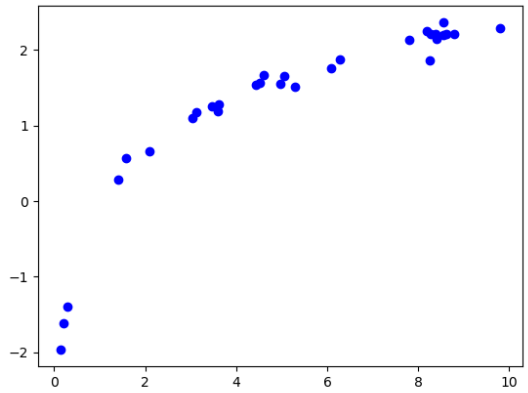
2. Determine the appropriate model for the graph of points below.



   A. Exponential model

   B. Linear model

   C. Non-linear Power model

   D. Logarithmic model

   E. None of the above

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3. The temperature of an object, T, in a different surrounding temperature

T_s will behave according to the formula $T(t) = Ae^{kt} + T_s$, where t is minutes, A is a constant, and k is a constant. Use this formula and the situation below to construct a model that describes the uranium's temperature, T, based on the amount of time t (in minutes) that have passed. Choose the correct constant k from the options below.

Uranium is taken out of the reactor with a temperature of 140° *C and is placed into a* 16° *C bath to cool. After 27 minutes, the uranium has cooled to* 76° *C.*

A. $k = -0.02605$

B. $k = -0.03138$

C. $k = -0.02552$

D. $k = -0.03138$

E. None of the above

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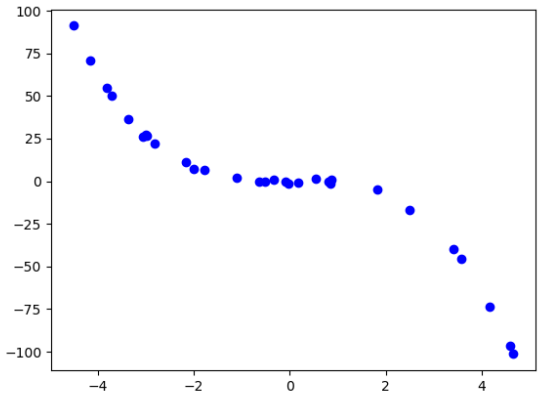
4. Determine the appropriate model for the graph of points below.



A. Exponential model

B. Logarithmic model

C. Non-linear Power model

D. Linear model

E. None of the above

5. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 28 liter 29 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 5 percent and 34 percent solutions, what was the amount she used of the 34 percent solution?

A. 23.17

B. 20.48

C. 14.00

D. 4.83

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

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

Pringles wants to add 45 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 20 percent

B. About 22 percent

C. About 4 percent

D. About 13 percent

E. None of the above

7. For the information provided below, construct a linear model that describes her total budget, B, as a function of the number of months, x she is at UF.

Aubrey is a college student going into her first year at UF. She will receive Bright Futures, which covers her tuition plus a $1000 educational expense each year. Before college, Aubrey saved up $5000. She knows she will need to pay $800 in rent a month, $50 for food a week, and $32 in other weekly expenses.

A. $B(x) = 6000 - 882x$

B. $B(x) = 6000 - 1128x$

C. $B(x) = 5118x$

D. $B(x) = 4872x$

E. None of the above.

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8. 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 quadrupled every 2 days. How long will it be until there are at least 1000 confirmed cases?

A. About 10 days

B. About 4 days

C. About 7 days

D. About 5 days

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

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9. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 27 liter 17 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 7 percent and 24 percent solutions, what was the amount she used of the 7 percent solution?

A. 15.88

B. 11.12

C. 13.50

D. 13.72

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

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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 41 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 3 percent

B. About 19 percent

C. About 12 percent

D. About 20 percent

E. None of the above
