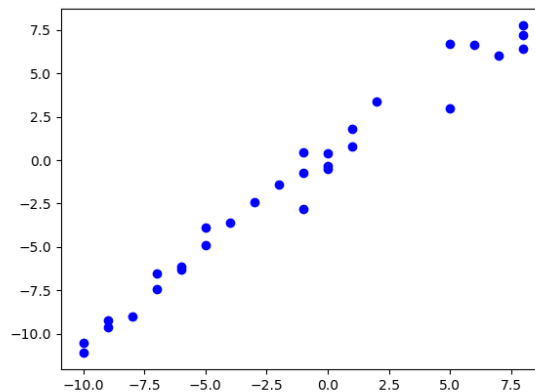


1. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 5 many cases reported, but the number of confirmed cases has doubled every 3 days. How long will it be until there are at least 1000000 confirmed cases?

- A. About 16 days
- B. About 18 days
- C. About 53 days
- D. About 37 days
- E. There is not enough information to solve the problem.

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



- A. Exponential model
- B. Non-linear Power model
- C. Linear model
- D. Logarithmic model
- E. None of the above

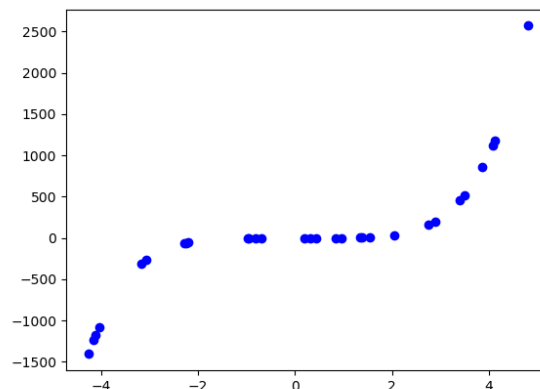
3. For the scenario below, use the model for the volume of a cylinder

as $V = \pi r^2 h$ to find the coefficient for the model of the new volume $V_{extnew} = kr^2 h$.

Pepsi wants to increase the volume of soda in their cans. They've decided to decrease the radius by 17 percent and increase the height by 12 percent. They want to model the new volume based on the radius and height of the original cans.

- A. $k = 0.01090$
- B. $k = 0.77157$
- C. $k = 2.42395$
- D. $k = 0.00347$
- E. None of the above.

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



- A. Logarithmic model
- B. Linear model
- C. Exponential model
- D. Non-linear Power model
- E. None of the above

5. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 23 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 18 percent and 46 percent solutions, what was the amount she used of the 46 percent solution?

- A. 12.70
- B. 5.75
- C. 17.25
- D. 11.50
- 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 28 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 14 percent
- B. About 9 percent
- C. About 3 percent
- D. About 13 percent
- E. None of the above

-
7. 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 130°C and is placed into a 12°C bath to cool. After 23 minutes, the uranium has cooled to 88°C .

- A. $k = -0.03209$
- B. $k = -0.02334$
- C. $k = -0.03263$
- D. $k = -0.01913$
- E. None of the above

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 tripled every 5 days. How long will it be until there are at least 1000 confirmed cases?

- A. About 28 days
- B. About 14 days
- C. About 15 days
- D. About 26 days
- E. There is not enough information to solve the problem.

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 12 percent and 28 percent solutions, what was the amount she used of the 12 percent solution?

- A. 18.56
 - B. 15.37
 - C. 13.50
 - D. 8.44
 - 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 27 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 14 percent
 - B. About 3 percent
 - C. About 13 percent
 - D. About 8 percent
 - E. None of the above
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