

Objective 3 - Solving Real-World Problems

Note: There are no textbook or videos directly to this section. If you want to review a certain type of model, you will need to go back to that Module.

We have spent a lot of time building models. Once we have a model, solving a real-world problem is just a matter of plugging in some values into your model.

Question 1 Chemists commonly create a solution by mixing two products of differing concentrations together. Find the amount of ??% acid solution and ??% acid solution needed to create a ?? liter ??% solution.

??% acid solution: liters

??% acid solution: liters

Question 2 There is initially ?? grams of element X . The half-life of element X is ?? years. How much element X will be left after ?? years?

grams

Question 3 A company sells doughnuts. They incur a fixed cost of \$?? for rent, insurance, and other expenses. It costs \$?? to produce each doughnut. The company sells each doughnut for \$??. How many doughnuts would they need to sell to break even?

doughnuts

Question 4 Kepler's Third Law: The square of the time, T , required for a planet to orbit the Sun is directly proportional to the cube of the mean distance, a , that the planet is from the Sun. Assume that Neptune's mean distance from the Sun is ?? AU and it takes Neptune about ?? months to orbit the Sun. If it takes Saturn about ?? months to orbit the Sun, what is Saturn's mean distance from the Sun?

Learning outcomes:
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Question 5 The half-life of carbon-14 is 5,730 years. A bone fragment is found that contains ??% of its original carbon-14. To the nearest year, how old is the bone?

years old

Question 6 Two UFPD are patrolling the campus on foot. To cover more ground, they split up and begin walking in different directions. Office A is walking at ?? mph directly south while Office B is walking at ?? mph directly west. How long would they need to walk before they are ?? miles away from each other?

minutes

Question 7 A population of bacteria ?? every hour. If the culture started with ??, how long would it take before the population is over ?? million?

hours
