

1. A large mixing tank currently contains 100 gallons of water into which 5 pounds of sugar have been mixed. A tap will open pouring 10 gallons per minute of water into the tank at the same time sugar is poured into the tank at a rate of 1 pound per minute.

Is that a greater concentration than at the beginning?

Create an equation that represents the amount of sugar in the tank	Create an equation that represents the amount of water in the tank
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Thinking about this problem in context name one constraint (real life restriction) that this problem would have that would affect the outcomes we could obtain from this equation.

2. An oil company estimates that the cost, C , in dollars, of cleaning up x percent of an oil spill can be modeled by the equation $C = \frac{kx}{100-x}$, where $0 \leq x < 100$, and k is a constant. The company has data that indicates that spending \$400,000 will clean up 70% of an oil spill.

Define the variables:

x :

C :

Use this information to find the value of k .

Use the model to predict the percentage of an oil spill that can be cleaned up if the company's budget is \$600,000.

3. The manufacturer of the water toy “Silly Soaker” quotes a variable cost of \$4.25 per unit and fixed costs of \$5,000.

Define the variables (make sure to include the letter you are going to use throughout the rest of the problem) :

Independent:

Dependent:

Create a function to represent the average cost per unit to manufacture the Silly Soaker.

Use this model to determine the average cost per unit for a level of production of $x = 10,000$ units.

What is the horizontal asymptote of this function, and what does it represent?