## Unit 4 Lesson 3: Understanding Rational Inputs

### 1 Keeping Equations True (Warm up)

#### Student Task Statement

1. Select **all** solutions to . Be prepared to explain your reasoning.
2. Select **all** solutions to . Be prepared to explain your reasoning.

### 2 Florida in the 1800’s

#### Student Task Statement

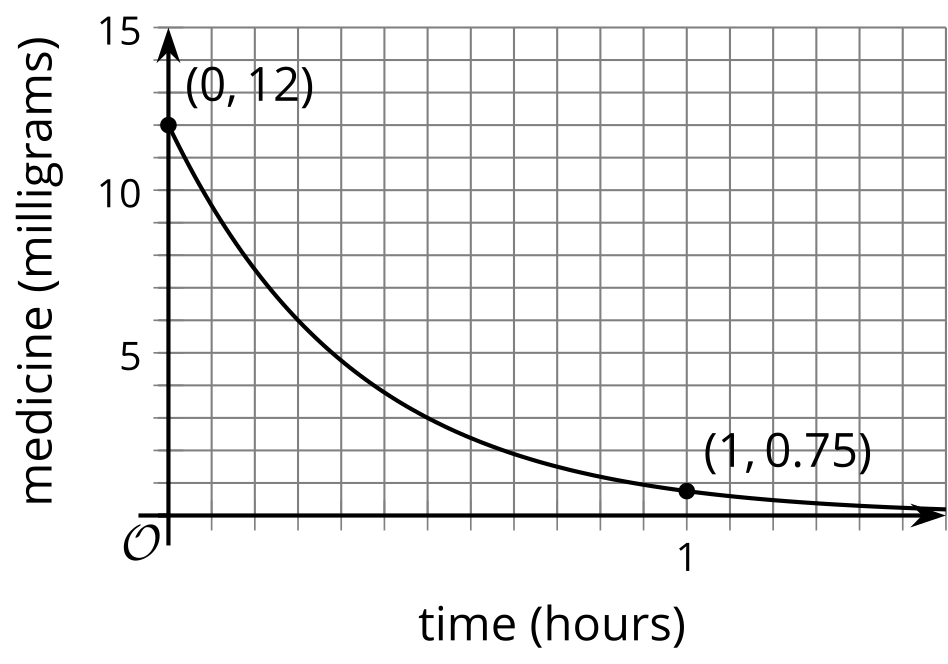
In 1840, the population of Florida was about 54,500. Between 1840 and 1860, the population grew exponentially, increasing by about 60% each decade.

1. Find the population of Florida in 1850 and in 1860 according to this model.
2. The population is a function of the number of decades after 1840. Write an equation for .
   1. Explain what means in this situation.
   2. Graph your function using graphing technology and estimate the value of .
   3. Explain why we can find the value of by multiplying 54,500 by . Find that value.
3. Based on the model, what was the population of Florida in 1858? Show your reasoning.

### 3 Disappearing Medicine

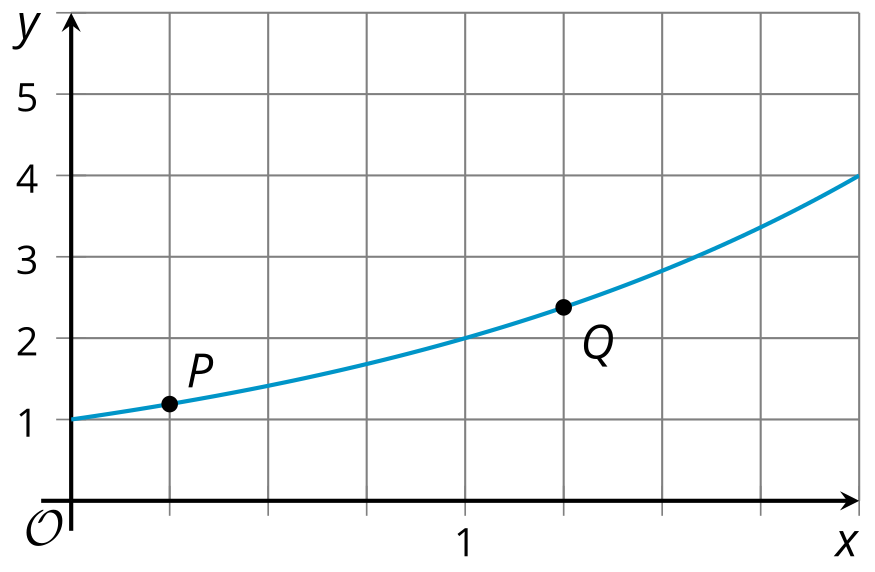
#### Student Task Statement

The amount of a medicine in the bloodstream of a patient decreases roughly exponentially. Here is a graph representing , an exponential function that models the medicine in the body of a patient, hours after an injection is given.



1. Use the graph to estimate and explain what it tells us in this situation.
2. After one hour, 0.75 mg of medicine remains in the bloodstream. Find an equation that defines .

#### Images for Activity Synthesis





© CC BY 2019 by Illustrative Mathematics®