Bellwork Alg 2 Tuesday, January 22, 2019

1. The value of a house has been decreasing 3.7% each year. In 2005 the value was $310,000. Find the value of the house in 2018 to the penny.

2. There is a US Census taken every 10 years. The population of a city in 2010 was 1,325,000. The population has been increasing 2.4% each census. Find the population in each of the following years to the nearest whole number.

a) 2018

b) 1997

3. The number of cells of a certain organism doubles every 40 minutes. At 8:30 am on a given day there were 80,000 cells. Find the number of cells at the given time rounded to the nearest whole number.

a) 3:20pm the same day

b) 10:15 pm the previous night

4. The half-life of a radioactive material is 3 days. If there is 1,500,000 grams of this material on June 19 find the number of grams of this material remaining on July 8. Round to the nearest hundredth.

Bellwork Alg 2 Tuesday, January 22, 2019 ANSWERS

1. The value of a house has been decreasing 3.7% each year. In 2005 the value was $310,000. Find the value of the house in 2018 to the penny.

$100 - 3.7 = 96.3\% \rightarrow b = 0.963$

$y = 310000(0.963)^x$ x = # yrs since 2005 = 2018 - 2005 = 13

$y = 310{,}000(0.963)^{13} =$ **$189,890.58**

2. There is a US Census taken every 10 years. The population of a city in 2010 was 1,325,000. The population has been increasing 2.4% each census. Find the population in each of the following years to the nearest whole number.

$100 + 2.4 = 102.4\%$

$b = 1.024$

$y = 1{,}325{,}000(1.024)^x$

x = # 10 yr periods since 2010

a) 2018

$x = \frac{2018 - 2010}{10}$

$x = .8$

$y = 1{,}325{,}000(1.024)^{.8}$

$y = 1{,}350{,}380$

b) 1997

$x = \frac{1997 - 2010}{10}$

$x = -1.3$

$y = 1{,}325{,}000(1.024)^{-1.3}$

$y = 1{,}284{,}772$

3. The number of cells of a certain organism doubles every 40 minutes. At 8:30 am on a given day there were 80,000 cells. Find the number of cells at the given time rounded to the nearest whole number.

$y = 80{,}000(2)^x$

x = # 40 min periods since 8:30 am

a) 3:20pm the same day

$x = \frac{8:30\text{am to } 3:20\text{pm}}{40\text{ min}}$

$= \frac{6\text{hrs } 50\text{min}}{40\text{min}}$

$= \frac{410\text{min}}{40\text{min}} = 10.25$

$y = 80{,}000(2)^{10.25} =$ **97,419,847 cells**

b) 10:15 pm the previous night

$x = \frac{8:30\text{am to } 10:15\text{pm previous night}}{40\text{ min}}$

$= -\frac{9\text{hrs } 75\text{min}}{40\text{ min}} = -\frac{615}{40} = -15.375$

$y = 80{,}000(2)^{-15.375} =$ **2 cells**

4. The half-life of a radioactive material is 3 days. If there is 1,500,000 grams of this material on June 19 find the number of grams of this material remaining on July 8. Round to the nearest hundredth.

$y = 1{,}500{,}000(0.5)^x$ x = # 3 day periods since June 19

$x = \frac{\text{June 19 to July 8}}{3\text{ days}} = \frac{19\text{ days}}{3\text{ days}} = 19/3$

$y = 1{,}500{,}000(0.5)^{19/3} =$

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