Bellwork   Alg 2B   Thursday, October 19, 2017

1. The number of cells of a certain bacteria doubles (increases by 100%) every 30 minutes. There are 400 cells at 2:00 am. Find the number of cells at each time.

a) Noon the same day.   b) 6:45 am the same day.   c) 10:15 pm the previous day.

2. Every 40 minutes the amount of medicine in your body decreases by 50% (called the half-life). If you took a 400mg dose at 10:00am find the amount of medicine in your system at each time.

a. 2:00 pm the same day.   b. 4:30 pm the same day.

3. Every five years the population of a city increases 11%. The population of this city in 1995 was 89,000. Find the population of this city in the following years to the nearest whole number.
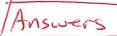
a) 2005   b) 1982   c) 2017

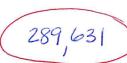Bellwork　　Alg 2B　　Thursday, October 19, 2017　　Answers

1. The number of cells of a certain bacteria doubles (increases by 100%) every 30 minutes. There are 400 cells at 2:00 am. Find the number of cells at each time.

$100\% + 100\% = 200\%$

EQ: $y = 400(2)^x$　　$x = $ # 30 min periods　　$b = 2$

a) Noon the same day.

$x = 20$

$\boxed{419,430,400}$

b) 6:45 am the same day.

$x = \dfrac{4\text{hr } 45\text{min}}{30} = \dfrac{285}{30}$

$\boxed{289,631}$

c) 10:15 pm the previous day.

$x = \dfrac{-3\text{hr } 45\text{min}}{30} = \dfrac{-225}{30}$

$\boxed{2}$

2. Every 40 minutes the amount of medicine in your body decreases by 50% (called the half-life). If you took a 400mg dose at 10:00am find the amount of medicine in your system at each time.
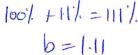
EQ: $y = 400(.5)^x$　　$x = $ # 40 min periods　　$100\% - 50\% = 50\%$　　$b = .5$

a. 2:00 pm the same day.

$x = \dfrac{4\text{hrs}}{40} = 6$

$\boxed{6.25 \text{ mg}}$

b. 4:30 pm the same day.

$x = \dfrac{6\text{hrs } 30\text{min}}{40} = \dfrac{390}{40}$

$\boxed{0.46 \text{ mg}}$

3. Every five years the population of a city increases 11%. The population of this city in 1995 was 89,000. Find the population of this city in the following years to the nearest whole number.

EQ: $y = 89,000(1.11)^x$　　$x = $ # 5 year periods　　$100\% + 11\% = 111\%$　　$b = 1.11$

a) 2005

$x = 2$

$\boxed{109,657}$

b) 1982

$x = \dfrac{-13}{5}$

$\boxed{67,850}$

c) 2017

$x = \dfrac{22}{5}$

$\boxed{140,868}$

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