1. 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.
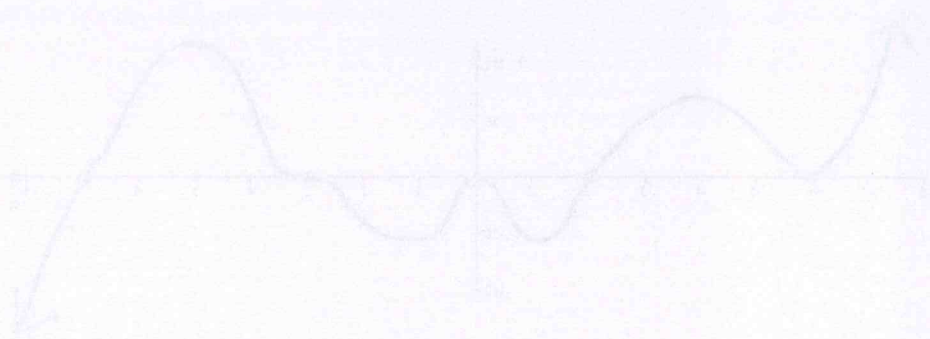
a) 2018

b) 1997

2. 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

3. Martin spent $855 on expenses for a trip. The expenses included hotel, rental car, and meals. He spent 50 percent more for the hotel than for the rental car and meals combined. What did Martin spend on his hotel?

A) $570   B) $513   C) $214   D) $155

4. If a and b are positive numbers such that $2b = 3a$, what is the value of $\frac{a+b}{b}$?

1. 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

$X = \dfrac{2018 - 2010}{10} = \dfrac{8}{10}$

$X = 0.8$

$\boxed{y = 1,350,380}$ people

$100 + 2.4 = 102.4\%$

$b = 1.024$

$X = $ # 10 yr periods since 2010

$y = 1,325,000(1.024)^X$

b) 1997

$X = \dfrac{1997 - 2010}{10} = \dfrac{-13}{10}$

$X = -1.3$

$\boxed{y = 1,284,772}$ people

2. 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

$X = \dfrac{8:30\,am \ \text{to}\ 3:20pm}{40\,min}$

$X = \dfrac{6hrs\ 50min}{40\,min}$

$X = \dfrac{410\,min}{40\,min} = 10.25$

$y = 80000(2)^{10.25} = \boxed{97,419,847}$ cells

$y = 80,000(2)^X$

$X = $ # 40 min periods since 8:30 am

b) 10:15 pm the previous night

$X = \dfrac{8:30\,am\ \text{to}\ 10:15pm\ \text{previous night}}{40\,min}$

$X = \dfrac{-9hrs\ 75min}{40min} = \dfrac{-615\,min}{40\,min}$

$X = -15.375$

$y = 80000(2)^{-15.375} = \boxed{2}$ cells

3. Martin spent $855 on expenses for a trip. The expenses included hotel, rental car, and meals. He spent 50 percent more for the hotel than for the rental car and meals combined. What did Martin spend on his hotel?

A) $570   B) $513   C) $214   D) $155

$H + C + M = 855$

$-H -H$

$C + M = 855 - H$ ⟶

$50\%\ MORE \Rightarrow 100 + 50 = 150\%$

$\Rightarrow 1.5$

$H = 1.5(C + M)$

$H = 1.5(855 - H)$

$H = 1282.5 - 1.5H$

$+1.5H + 1.5H$

$\dfrac{2.5H}{2.5} = \dfrac{1282.5}{2.5}$ $\boxed{H = 513}$

4. If a and b are positive numbers such that $2b = 3a$, what is the value of $\dfrac{a+b}{b}$?

$\dfrac{2b}{3} = \dfrac{3a}{3}$

$a = \dfrac{2}{3}b$

$\dfrac{a+b}{b} = \dfrac{\frac{2}{3}b + b}{b} = \dfrac{2}{3} + 1$

$= \dfrac{2}{3} + \dfrac{3}{3}$

$= \boxed{\dfrac{5}{3}}$

1