

Math 111 Quiz #4 Solutions

1. Increasing by 20%: $300(1.20) = 360$ Then, decreasing by 20%: $360(0.8) = \boxed{288}$

2. (a) The initial bacteria population is $\boxed{30 \text{ thousand.}}$

(b) After 2 hours, there will be $g(10) = 30(2)^2 = \boxed{120 \text{ thousand bacteria or } 120,000 \text{ bacteria}}$

3. The growth factor is 1.15 \Rightarrow The balance will be given by $\boxed{B = 700(1.15)^t.}$

4. Since f is exponential, $f(x) = a \cdot b^x$ $\Rightarrow a \cdot b^1 = 1$ and $a \cdot b^{-1} = \frac{1}{16}$

$$\Rightarrow \frac{a}{b} = \frac{1}{16}$$

$$\Rightarrow a = \frac{b}{16}$$

Substitution: $\left(\frac{b}{16}\right) \cdot b = 1 \quad \Rightarrow \quad \frac{b^2}{16} = 1 \quad \Rightarrow \quad b^2 = 16 \quad \Rightarrow \quad b = 4$

Solving for a : $a = \left(\frac{4}{16}\right) = \frac{1}{4}$

So, $\boxed{f(x) = \frac{1}{4}(4)^x.}$