2.5.B Exponential Function Context and Data Modeling

AP Precalculus Name: _____ **CA #1**

Identify the percent increase or decrease of each function.

1. $f(x) = 10(0.985)^x$	2. $f(n) = 1.4(2.85)^n$	3. $y = 6(1.516)^x$	4. $f(x) = 10(0.2)^x$

For each problem, create a function to model the scenario.

5. A house sold for \$350,000. Housing prices p are expected to increase 2.1% per year t.	6. The number of visitors v to flippedmath.com doubles every 7 months m. There are currently 120,000 visitors to the website.	7. Mr. Kelly's IQ (I) is currently 105, but it is decaying at a rate of 5.8% every decade d.
8. The rodent population p in a large city is being controlled by a new poison that kills half the population every 2 months m. There are currently 1,000,000 rodents in the city.	9. A virus is spreading through the United States. On day zero, there are 121 cases c who have the virus, but it spreads at a rate of 582% increase every day d.	10. There are 3 cockroaches c behind Mr. Brust's microwave, and their population doubles every 14 days d.

11. The value v of a new motorcycle purchased for \$11,000 decreases by 15.7% per year t.	12. There is 207 grams g of radioactive material. Its half-life is 6,000 years t. How much radioactive material will there be in 15,000 years?

For each of the problems below, identify how the equivalent form reveals a different property.

13. If $f(m) = 1.1^m$ indicates that the quantity increases by a factor of 1.1 every minute, then what does $f(m) = (1.1^{60})^{(m/60)}$ indicate?	14. If $f(t) = 3^t$ indicates that the quantity increases by a factor of 3 every month, then what does $f(t) = (3^{12})^{(t/12)}$ indicate?

Answers to 2.5.B CA #1

1. 1.5% decrease	2. 185% increase	3. 51.6% increase	4. 80% decrease
5. $p(t) = 350{,}000(1.021)^t$	6. $v(m) = 120{,}000(2)^{t/7}$	7. $I(d) = 105(0.942)^d$	
8. $p(m) = 1{,}000{,}000\left(\frac{1}{2}\right)^{m/2}$	9. $c(d) = 121(6.82)^d$	10. $c(d) = 3(2)^{d/14}$	
11. $v(t) = 11{,}000(1.157)^t$		12. $g(t) = 6{,}000\left(\frac{1}{2}\right)^{t/6000}$	
13. The quantity increases by a factor of 1.1^{60} every hour.		14. The quantity increases by a factor of 3^{12} every year.	