% → decimal ÷100

Exponential Functions
Homework

Name Key
Date _____ Period ____

Sol. $y = ab^x$

| | | |
|---|---|---|
| Formula for Growth: | $A = P(1 + r)^t$ | A = Final amount<br>P = Initial amount<br>r = rate % → convert to decimal<br>t = time in years |
| Formula for Decay: | $A = P(1 - r)^t$ (b-factor) | |

1. Sallie Mae just found out that in 1800 one of her ancestors invested $300 in a savings account that paid 4% interest annually. Find the account balance after the year 1950.

Growth

P = 300 Equation $y = 300(1 + 0.04)^{150}$

r = 4% → 0.04

t = 150 Account balance $107,676.80

2. For California, the population in 1900 was 1.77 million. Since then, the population has grown at a rate of 3% per year. According to this rate, what was the population in 2000?

1,770,000

Growth

P = 1.77 Equation $y = 1.77(1 + 0.03)^{100}$

r = 3% → 0.03

t = 100 Population 34.02 million * match decimal places

3. Suppose the acreage of forest is decreasing by 4% every year because of development. If there are currently 6,000,000 acres of forest, determine the amount of forest left after 15 years.

Decay

P = 6,000,000 Equation $y = 6,000,000(1 - 0.04)^{15}$

r = 4% → 0.04

t = 15 Forest acreage 3252518 acres

4. A $55,000 purchase depreciates at 16% each year. What would the value be after 10 years?

Decay

P = 55,000 Equation $y = 55,000(1 - 0.16)^{10}$

r = 16% → 0.16

t = 10 Value $9619.57