Math II Analyzing Exponential Functions

Find the percent rate of change of $f(t)$ for each unit of t. State whether the function shows exponential growth or decay.

1. $f(t) = 110(0.95)^t$ $.95 - 1 = -.05$ -5% Decay

2. $f(t) = 1.08(1.07)^t$ $1.07 - 1 = .07$ 7% Growth

3. $f(t) = 30(0.90)^{4t}$ $(.90^4)^t = .6561 - 1 = -.3439 = -34.39\%$ Decay

4. $f(t) = 63(0.87)^{11t}$ $(.87^{11})^t = .216 - 1 = -.784 = -78.4\%$

5. $f(t) = 500(1.15)^{2t}$ $(1.15^2)^t = 1.3225 - 1 = .3225 = 32.25\%$ Growth

Use the information below to complete problems 6–8.

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The deer population, p, in a forest preserve t years after 2005 can be estimated using the function $p(t) = 440(0.92)^t$.

$a(1+r)^t$

6. What was the size of the deer population in 2005?

440

7. What is the yearly rate of change of the population?

.92 − 1 = −.08 − 8%

−

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8. The wolf population may be related tot he deer population. The wolf population , w, can be estimated t years after 2005 using the function $w(t) = 84(0.98)^{2t}$. Which population is changing faster? Explain your answer.

$84(.98)^{2t}$

$84(.98^2)^t$

$84(.9604)^t$

.9604 − 1 = −.0396

−3.96%

Deer population is decreasing faster −8% vs. ≈−4%

Use the information below to complete problems 9 and 10.

Neal opens a savings account that earns interest monthly. He can estimate the total dollars in his account, d(t), t years after opening the account by using $d(t) = 4000(1.0008)^{12t}$.

9. How much money did Neal initially put into the account?

10. What is the yearly rate of change of the account? Is it growing or decaying? How can you tell?

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four Thousand Dollars

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$(1.0008^{12}) = 1.0096 - 1 = .0096 = .96\%$

Growth