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## 4-3 Solving Exponential Functions

Determine if the exponential function is increasing or decreasing. EXPLAIN your answer.

1. The equation for the value of a collector's edition Batman comic book is $V(t)=20(1+.02)^{t}$. Is the value increasing or decreasing in value each year? How do you know?
2. The equation for the value of a certain car is $V(t)=20000(1-.025)^{t}$. Is the value increasing or decreasing each year? How do you know?

Given the following equations, state the initial value and rate.
3. $A(t)=43000\left(1+\frac{.095}{4}\right)^{4 t}$
4. $A(t)=1800 e^{.04 t}$
5. $V(t)=3000(1-.065)^{t}$

Initial:
Initial:
Initial
Rate:
Rate:
Rate:
Solve the following using the appropriate exponential equation.

$$
A(t)=P\left(1 \pm \frac{r}{n}\right)^{n t} \quad A(t)=P e^{r t} \quad A(t)=a(1 \pm r)^{t}
$$

6. In 2000, the population of Lehi was 26,000 , and was increasing at a rate of $8.5 \%$ per year. Use the given equation. $\quad P(t)=26000(1+.085)^{t}$
a) Predict the population of Lehi in 2015.
b) When will the population reach 100,000 ?
7. John purchased a car in 2010 for $\$ 23,000$ and it depreciates at a rate of $4.5 \%$ per year. How much will the car be worth in 2018?
8. If Hugh invests $\$ 1500$ at $4 \%$ compounded quarterly, how much money will he have after 7 years?
9. If Bob invests $\$ 2400$ at $3.6 \%$ compounded continuously, how long will it take him to reach $\$ 4800$ ?
