minimum/at least: $\geq$
maximum/at most: $\leq$

$A=P(1\pm r)^t$ nothing below
$A=P(1+\frac{r}{n})^{nt}$ compounded
$A=Pe^{rt}$ continuously
$A=P(\frac{1}{2})^{\frac{t}{h}}$ half life
$A=P(1\pm r)^{\frac{t}{h}}$ irregular time

Name Schlansky   Date ________________
Mr. Schlansky   Algebra II

Modeling Exponential Functions with Inequalities

1. Tage deposits $2500 into an account that earns 2.7% interest compounded continuously. Which inequality can be used to determine how long it will take for his account to have at least $4000? ≥ 4000

P r=.027 Pert

1) $2500(1.027)^t \leq 4000$
2) $2500(1.027)^t \geq 4000$
3) $2500e^{.027t} \leq 4000$
4) $2500e^{.027t} \geq 4000$

P=2500
r=.027
t=t

$Pe^{rt} \geq 4000$
$2500e^{.027t} \geq 4000$

2. Lamar has 2000 ants in an ant colony and the population is doubling every 4 days. His tank can hold a maximum amount of 325000 ants. Which inequality can be used to determine how many days, d, can pass before he will need to buy a bigger tank? ≤ 325000

P double time/half life h

1) $2000(2)^{\frac{d}{4}} \leq 325000$
2) $2000(2)^{\frac{d}{4}} \geq 325000$
3) $2000(4)^{\frac{d}{2}} \leq 325000$
4) $2000(4)^{\frac{d}{2}} \geq 325000$

P=2000
t=d
h=4

$P(2)^{\frac{t}{h}} \leq 325000$
$2000(2)^{\frac{d}{4}} \leq 325000$

3. Caleb bought a car for $19,100 and its value is decreasing by 12% each year. He wants to sell his car while its value is greater than $5000. Which inequality can be used to find the maximum number of years, t, he can keep his car while its value is greater than $5000? ≥ 5000

P r=.12

1) $19100(.12)^t \geq 5000$
2) $19100(.12)^t \leq 5000$
3) $19100(.88)^t \geq 5000$
4) $19100(.88)^t \leq 5000$

P=19100
r=.12
t=t

nothing below
$P(1\pm r)^t \geq 5000$
$19100(1-.12)^t \geq 5000$
$19100(.88)^t \geq 5000$

4. A sample of 2000 grams of Fluorine-18 has a half life of 109.734 minutes. Which inequality can be used to represent how many minutes, m, can pass for there to be a minimum of 67 grams remaining? ≥ 67

P h

1) $2000(\frac{1}{2})^{\frac{t}{109.734}} \geq 67$
2) $2000(\frac{1}{2})^{\frac{t}{109.734}} \leq 67$
3) $2000(2)^{\frac{t}{109.734}} \geq 67$
4) $2000(2)^{\frac{t}{109.734}} \leq 67$

P=2000
h=109.734
t=t

$P(\frac{1}{2})^{\frac{t}{h}} \geq 67$
$2000(\frac{1}{2})^{\frac{t}{109.734}} \geq 67$