Name
Hour $\qquad$

1. Connor bought a car for $\$ \mathbf{2}, 500$. It depreciates each year by $\mathbf{3 0 \%}$ so the car is only worth $\qquad$ \% of the original price. How much will the car be worth in 7 years? $y=a b^{x}$
2. If there are initially 3500 bacteria in a culture, and the number of bacteria double each hour, the number $\mathbf{N}$ of bacteria after $t$ hours can be found using the formula $N=3500(2)^{t}$. How many bacteria will be present after 4 hours?
3. You put $\$ 1,000$ in the bank that has an annual interest rate of $5.5 \%$ that is compounded continuously. What will the balance be in $\mathbf{2 5}$ years if you just keep it in there? $A=P e^{r t}$
4. Your little brother starts a savings account with $\$ \mathbf{5 0}$. His interest rate is $\mathbf{7 \%}$ annually and is compounded semi-annually. How much will be in the savings account in 30 years? $A=P\left(1+\frac{r}{n}\right)^{n t}$
5. The population $P$ of 220 animals decreasing can be represented by the model $P=220(0.81)^{t}$, where $t$ is the number of years.
a. Estimate the number of animals remaining after 4 years.
b. Estimate the number of animal remaining after 6 years.
c. What happens to the population of animals after 40 years?
6. Graph $y=2(3)^{x}$
x-int: $\qquad$
$y$-int:
Domain:
$\qquad$

Range: $\qquad$
Asymptote: $\qquad$

7. Graph $y=e^{x}+3$
x-int: $\qquad$
$y$-int:
Domain:
Range: $\qquad$
Asymptote: $\qquad$ -


Decide whether the following functions are exponential growth or exponential decay.
8. $y=0.2(3)^{x}$
9. $y=4\left(\frac{1}{5}\right)^{x}$
10. $y=3\left(\frac{2}{3}\right)^{-x}$
11. $y=0.8(1.02)^{x}$
12. $y=\left(\frac{5}{2}\right)^{-x}$
13. $y=16(0.96)^{x}$

Use the rules of exponents to simplify.
14. $\frac{9 e^{2}}{6 e^{x}}$
15. $\left(3 e^{5 x}\right)^{4}$
16. $7 e^{4} \cdot 2 e^{10}$

