LESSON 98

1. Exponential decay ($b = 0.96 < 1$)

2. The population decreases by 4% each year.

3. a. $a = 50000, b = 1.05$
The function is $y = 50000(1.05)^t$.

b. When $t = 7$, $y = 70355.02113\ldots$.
The salary will be about $\$70{,}355$.

4. a. $a = 50000, b = 0.95$
The function is $y = 50000(0.95)^t$.

b. When $t = 7$, $y = 34916.86480\ldots$.
The population will be about 34917.

5. a. $a = 300, b = 0.6$, exponent $= t/10$
The function is $y = 300(0.6)^{t/10}$.

b. When $t = 30$, $y = 64.8$.
There will be about 65 bears.

6. $a = 3000, b = 1.04$
The function is $y = 3000(1.04)^t$.

It is exponential growth ($b = 1.04 > 0$).

When $t = 8$, $y = 4105.70715\ldots$.
The balance will be about $\$4{,}106$.

7. $a = 60000, b = 1.06$
The function is $y = 60000(1.06)^t$.

It is exponential growth ($b = 1.06 > 0$).

When $t = 10$, $y = 107450.86179\ldots$.
The salary will be about $\$107{,}451$.

8. $a = 25000, b = 0.9$
The function is $y = 25000(0.9)^t$.

It is exponential decay ($b = 0.9 < 0$).

When $t = 6$, $y = 13286.025$.
The value of the car will be about $\$13{,}286$.

9. $a = 30000, b = 0.96$
The function is $y = 30000(0.96)^t$.

It is exponential decay ($b = 0.96 < 0$).

When $t = 8$, $y = 21641.68736\ldots$.
The population will be about $21{,}642$.

10. $a = 1013, b = 0.86$
The function is $y = 1013(0.86)^t$.

It is exponential decay ($b = 0.86 < 0$).

When $t = 5$, $y = 476.54256\ldots$.
The pressure will be about 477 millibars.

11. $a = 50, b = 2$, exponent $= t/2$
The function is $y = 50(2)^{t/2}$.

It is exponential growth ($b = 2 > 0$)

When $t = 10$, $y = 1600$.
There will be 1600 bacteria.

12. $a = 300, b = 1.2$, exponent $= t/5$
The function is $y = 300(1.2)^{t/5}$.

It is exponential growth ($b = 1.2 > 0$)

When $t = 30$, $y = 895.7952$.
The website will have about 896 hits.

13. Let $t =$ year. Note that 6 months is 0.5 year.

$a = 10000, b = 1.02$, exponent $= t/0.5$
The function is $y = 10000(1.02)^{t/0.5}$.

It is exponential growth ($b = 1.02 > 0$)

When $t = 20$, $y = 22080.39663\ldots$.
There will be about $\$22{,}080$.