

Answers to WS 1

1. a. The values of N are recorded below:

t	0	1	2	3	4	5
N	5	8	11	14	17	20

The general formula is $N(t) = 5 + 3t$.

2. The values of P (rounded to three decimal places) are recorded below:

t	0	1	2	3	4	5
N	10	10.3	10.609	10.927	11.255	11.593

The general formula is $P(t) = 10(1.03)^t$

3. a. $\Delta P = 900$ when $P = 60,000$

b. $P(t) = P(0)(1.015)^t$

4. a. $\frac{dP}{dt} = 0.009P$

b. $\frac{dP}{dt} = .3375$ millions of individuals per year, or 337,500 individuals/year

5. a. $\frac{dF}{dt} = -0.029F$

b. $F(t) = F_0 e^{-0.029t}$

c. $F(10) = e^{-0.29} F_0 = 0.748 F_0 = 74.8\%$ of F_0 .

6. $\Delta N = 3$; $N(t) = 2 + 3t$

7. $\Delta N = N$; $N(t) = 3 \cdot 2^t$