c) if $F(t) = F_0 e^{(-0.1)t}$

$$\frac{dF}{dt} = \frac{d}{dt}\left(F_0 e^{-0.1t}\right)$$

$$\frac{dF}{dt} = (-0.1) F_0 e^{-0.1t}$$

the sign is negative because the forest population ($F(t)$) is decreasing $\frac{dF}{dt} < 0$

$$\frac{dF}{dt} = -0.1\,F \quad , \text{ where } F = F_0 e^{-0.1t}$$

#3 a) $\frac{dy}{dt} = 3y$

general solution: $y(t) = Ce^{3t}$

if $y(0) = 5$,

$$5 = Ce^{(3)(0)} = C \cdot 1 \Big\} \text{ solve for } C$$

$$C = 5$$

solution: $y(t) = 5e^{3t}$

b) $\frac{dy}{dx} = -0.01y$

general solution = $y(x) = Ce^{-0.01x}$

$y(2) = 1$

$$1 = Ce^{-0.01(2)}$$

$$C = \frac{1}{e^{-0.01(2)}} = 1.02$$

solution: $y(x) = 1.02\, e^{-0.01x}$