Homework assigned Monday, January 9.

Problem 1. Let $N(t)$ satisfy $N'(t) = 1.3N(t)$ and $N(0) = 45$.

(a) Give a formula for $N(t)$.
(b) What is $N(10)$?
(c) How long before $N(t)$ becomes 1,000?
(d) How long before N doubles?

Problem 2.
Let a be a constant. Assume that $P(t)$ satisfies

$$\frac{dP}{dt} = aP$$

and

$$P(0) = 30, \qquad P(2) = 40.$$

(a) Give a formula for $P(t)$ that involves a and $P(0)$.
(b) Now use that $P(2) = 40$ to solve for a.
(c) What is the doubling time of $P(t)$?

Problem 3. Let $N(t)$ satisfy $N'(t) = -.05N(t)$, and $N(0) = 200$.

(1) Find a formula for $N(t)$.
(2) How long before N becomes 10?