

Name _____

No calculators allowed!

1. (2 points) Given that $2^t = 3$, what is the exact value of t ?

(a) $\frac{2}{3}$

(b) $\frac{3}{2}$

(c) $\ln\left(\frac{2}{3}\right)$

(d) $\ln\left(\frac{3}{2}\right)$

(e) $\frac{\ln 2}{\ln 3}$

(f) $\frac{\ln 3}{\ln 2}$

2. (3 points) For which one of the following discrete dynamical systems is $u(n)$ oscillating toward its equilibrium value and getting 20% closer each day? (Assuming n is measured in days)

(a) $u(n) = -0.2u(n-1) + 0.8$

(b) $u(n) = 0.2u(n-1) - 0.8$

(c) $u(n) = -0.8u(n-1) + 0.2$

(d) $u(n) = 0.8u(n-1) - 0.8$

(e) $u(n) = -1.2u(n-1) + 0.2$

(f) $u(n) = 1.2u(n-1) - 0.2$

3. (5 points) Find an expression that satisfies the dynamical system with initial value shown.

$$u(n) = 0.8u(n - 1) + 20$$

$$u(0) = 80$$