

**MthSc 208: Differential Equations (Fall 2011)**  
**In-class Worksheet 4b: Systems of differential equations (real eigenvalues)**

NAME:

Consider the system of differential equations: 
$$\begin{cases} x_1' = -2x_1 + x_2 - 12, & x_1(0) = 5 \\ x_2' = 4x_1 + x_2 - 18, & x_2(0) = 20 \end{cases}$$

1. Write this in matrix form,  $\mathbf{x}' = \mathbf{A}\mathbf{x} + \mathbf{b}$ , and find the steady-state solution,  $\mathbf{x}_{ss}$ .

2. Make a change of variables to transform the system into a homogeneous system.

