Math 105.04 Fall 2003
Matrix Arithmetic

Consider the matrices P, Q, and R given by

$$P = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ -1 & 2 \end{bmatrix}, \quad Q = \begin{bmatrix} 1 & 1 & 2 \\ -1 & -1 & 0 \end{bmatrix}, \quad R = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}.$$

Solve the system of linear equations defined by the matrix equation

$$AX = B$$

where

$$A = 2(P \cdot Q) - 3(R^{-1}), \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}, \quad \text{and} \quad B = \begin{bmatrix} 1 \\ 5 \\ 17 \end{bmatrix}.$$