

NAME:

SECTION:

**Quiz 4:** No calculators. Justify all answers. No partial credit is given for an unexplained and incorrect answer.

The matrix

$$A = \begin{pmatrix} 8 & -3 \\ 18 & -7 \end{pmatrix}$$

has eigenvectors  $v_1 = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$  and  $v_2 = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ .

1. (3 pts) What is the eigenvalue of  $A$  associated to eigenvector  $v_1$ ?

2. (3 pts) What is the eigenvalue of  $A$  associated to eigenvector  $v_2$ ?

3. (3 pts) Give the general solution to the differential equation

$$\frac{d}{dt}\mathbf{x} = \begin{pmatrix} 8 & -3 \\ 18 & -7 \end{pmatrix} \mathbf{x}$$