| Name: |
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MATH 3306
Quiz 7.5
Consider the following system of differential equations:

$$
x_{1}^{\prime}=5 x_{1}-x_{2} \quad \text { and } \quad x_{2}^{\prime}=3 x_{1}+x_{2}
$$

(1) Write the system of equations in a vector/matrix form $\left(\vec{x}^{\prime}=A \vec{x}\right.$, what is $A$ ?):
(2) Find the eigenvalues and corresponding eigenvectors (Mathematica) for the coefficient matrix and write the general solution for this system of equations.
(3) Find the particular solution if the initial conditions are:

$$
\vec{x}(0)=\binom{2}{-1}
$$

