Section 9.1
Solve Problems 13, 15, 17, 18, 19

Section 9.2
Find all the critical points in each of the system in Problems 5, 7, 10, 13, 15, 16

Stability/instability
Using the definition of stability and instability to show that the critical point of each of the following differential equations is stable or unstable.

(a) \( x'(t) = \begin{pmatrix} -2 & 1 \\ 1 & -2 \end{pmatrix} x \)

(b) \( x'(t) = \begin{pmatrix} 1 & -2 \\ 3 & -4 \end{pmatrix} x \)

(c) \( x'(t) = \begin{pmatrix} 1 & 1 \\ 4 & -2 \end{pmatrix} x + \begin{pmatrix} \alpha \\ \beta \end{pmatrix} \), for some given constants \( \alpha, \beta \).