For example,

1) If $\det A < 0 \Rightarrow$ it is a saddle point
(because then $\lambda_1 \lambda_2 < 0$)

2) If discriminant > 0 & $\det A > 0 \Rightarrow$ it is a node
(because λ_1, λ_2 are real and of the same sign)
If in addition to this $\operatorname{tr} A < 0 \Rightarrow$ nodal sink
(because then $\lambda_1 + \lambda_2 < 0 \Rightarrow$ both of them are negative)
and if $\operatorname{tr} A > 0 \Rightarrow$ nodal source
(because then $\lambda_1 + \lambda_2 > 0 \Rightarrow$ both of them a positive)

3) If $\Delta < 0 \Rightarrow$ complex roots, then
$\operatorname{tr} A < 0 \Rightarrow$ spiral sink
$\operatorname{tr} A = 0 \Rightarrow$ center
$\operatorname{tr} A > 0 \Rightarrow$ spiral source

4) If $\Delta = 0 \Rightarrow$ repeated eigenvalue
If $A = \lambda I \Rightarrow$ proper node
otherwise $\Rightarrow$ improper node
If in addition $\operatorname{tr} A < 0 \rightarrow$ stable
$\operatorname{tr} A > 0 \rightarrow$ unstable

See also Figure 9.1.9 page 497 of the textbook nicely summarizing this

Rough sketch of the phase portrait for problem 21