Another R&J problem: Do opposites attract?

Okay, here's another stunningly important question... do opposites attract? Consider the following dynamical system

$$\begin{aligned} \frac{dR}{dt} &= R + 2J \\ \frac{dJ}{dt} &= -R - 2J \end{aligned}$$

where Juliet's response is always exactly opposite that of Romeo's.

1. Find the general solution to this dynamical system for arbitrary initial condition $\mathbf{u}_0$.

2. Do opposites attract? What happens as $t \to \infty$ if they start out equally in love $R = J = 1$?

3. draw the "phase portrait" of this love affair. Describe the set of all "steady state" solutions (this thing is called an attractor).

Review/challenge question (not graded but fun)
Analyze the general form of this problem

$$\begin{aligned} \frac{dR}{dt} &= aR + bJ \\ \frac{dJ}{dt} &= -aR - bJ \end{aligned}$$

for all real a and b.