1. Prove that if $f \in R[a,b]$ and $c, r, d \in [a,b]$ (not necessarily distinct) then:

$$\int_c^d f = \int_c^r f + \int_r^d f.$$

Note we proved this in class when $c < r < d$, but now you need to show it with our extended definition of the integral.

2. Prove that if $f, g \in R[a,b]$ and $c, d \in [a,b]$ (not necessarily distinct) then:

$$\int_c^d f + g = \int_c^d f + \int_c^d g.$$

Again we proved this in class when $c < d$.