Slide 47:

$$v_o = v_A - v_B = \frac{R_1 v_{ref}}{(R_1 + R_2)} - \frac{R_3 v_{ref}}{(R_3 + R_4)} = \frac{(R_1 R_4 - R_2 R_3)}{(R_1 + R_2)(R_3 + R_4)} v_{ref}$$

Differential relation (from Calculus; remember this)

$$\delta v_o = \frac{\partial v_o}{\partial R_1}\delta R_1 + \frac{\partial v_o}{\partial R_2}\delta R_2 + \frac{\partial v_o}{\partial R_3}\delta R_3 + \frac{\partial v_o}{\partial R_4}\delta R_4$$

Obtain the derivatives: $\frac{1}{v_{ref}}\frac{\partial v_o}{\partial R_1} = \frac{(R_1 + R_2) - R_1}{(R_1 + R_2)^2} = \frac{R_2}{(R_1 + R_2)^2}$; $\frac{1}{v_{ref}}\frac{\partial v_o}{\partial R_2} = -\frac{R_1}{(R_1 + R_2)^2}$

Hence, the first two terms of the original equation give: $\frac{R_2 \delta R_1 - R_1 \delta R_2}{(R_1 + R_2)^2}$

Similarly, the remaining two terms give: $-\frac{R_4 \delta R_3 - R_3 \delta R_4}{(R_3 + R_4)^2}$

The relation is valid for “small” changes.