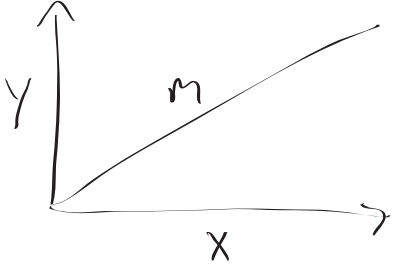
$$\frac{d[CO_2]}{dDIC} \simeq \frac{[CO_2]}{[CO_3^{2-}]} \simeq \frac{1}{20}$$

think of:
$y = m x$

$$\frac{dy}{dx} = m$$



double DIC

$$\Delta DIC = 2DIC - DIC$$

$$\Delta[CO_2] = \frac{1}{20}\Delta DIC$$

$$\Delta[CO_2] = \frac{1}{20} \cdot 2.1\ mmol[DIC]$$

$$\Delta[CO_2] = 0.1\ mmol[CO_2]$$

$$\frac{\Delta[CO_2]}{K_0} = \Delta pCO_2$$

$$\frac{0.1\ mmol[CO_2]}{K_0} = 3.7\ ppt\ atm \text{ or } 3700\ ppm$$

What if we assume pCO_2 from 280 ppm (pre-industry) to 410 ppm is CO_2 injection to ocean... How much DIC change?

$$\frac{\Delta[CO_2]}{K_0} = 130\ ppm\ atm$$

$$\Delta[CO_2] = 3.7\ \mu mol[CO_2]$$

$$20 \cdot 3.7\ \mu mol[CO_2] = \Delta DIC$$

$73\ \mu mol/kg$ change in DIC

or 3.5 % increase → ocean has 3200×10^{15} mol C

So increase in 110×10^{15} mol C

★ if we added 1 mol C every ms ($1e^{-3}$ s), would take 209 ma