SOLVE MICHAELIS-MENTEN EQUATION FOR K_M WHEN $V_0 = \frac{V_{max}}{2}$

$$Equation\ 1 : \frac{1}{\frac{V_{max}}{2}} = \frac{K_m}{V_{max} * [S]} + \frac{1}{V_{max}}$$

$$= \frac{2}{V_{max}} = \frac{K_m}{V_{max} * [S]} + \frac{1}{V_{max}}$$

$$= \frac{K_M}{V_{max} * [S]} = -\frac{2}{V_{max}} + \frac{1}{V_{max}}$$

$$= \frac{K_M}{V_{max} * [S]} = \frac{1}{V_{max}}$$

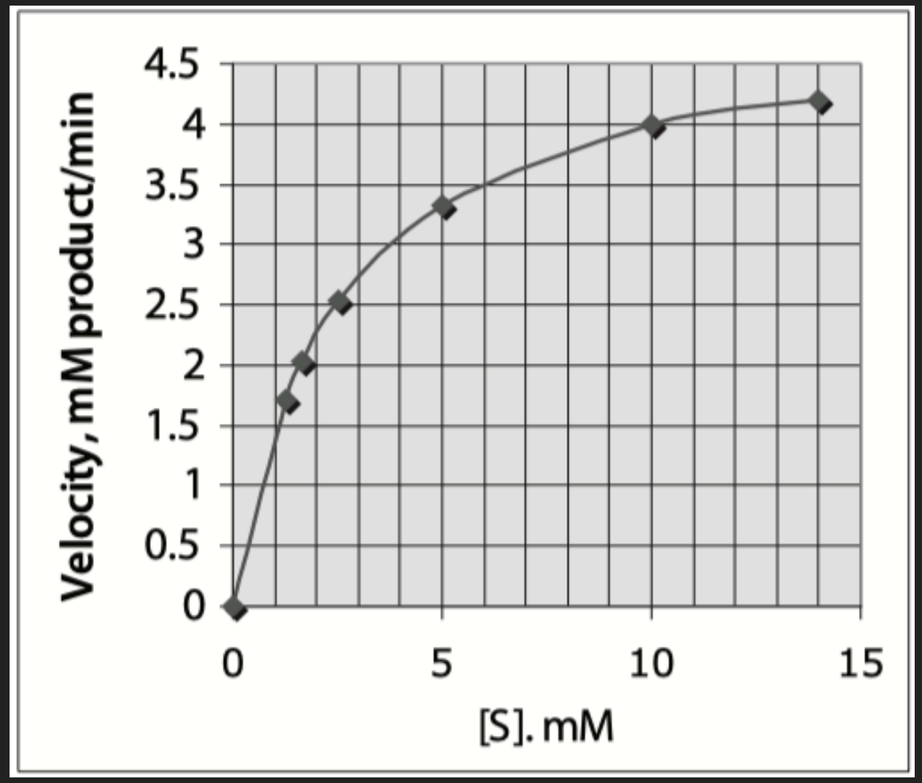
$$= K_M = \frac{1}{V_{max}} * (V_{max} * [S])$$

$$= K_M = [S]$$

- As K_M increases , you need MORE substrate concentration to reach $\frac{V_{max}}{2}$
- As K_M decreases , you need LESS substrate concentration to reach $\frac{V_{max}}{2}$
- K_M = substrate concentration at $\frac{V_{max}}{2}$

GRAPH – 1

- What is the K_M value as you can estimate from Graph 1 ?
  - $V_{max} \approx 4.5$
  - $\frac{V_{max}}{2} = 2.25$
  - $\therefore K_M \approx 2.25$



- As K_M INCREASES , the curve shifts Left
- As K_M DECREASES , the curve shifts Right