[S] (M)	V (μmol/min)	V (+ inhibitor) (μmol/min)
6×10^{-6}	20.8	12
1×10^{-5}	29	15
2×10^{-5}	45	20
6×10^{-5}	67.6	24
1.8×10^{-4}	87	28

[S] (M)	V (μmol/min)	V (+ inhibitor) (μmol/min)
166666.7	0.048076923	0.083333333
100000	0.034482759	0.066666667
50000	0.022222222	0.05
16666.67	0.014792899	0.041666667
5555.556	0.011494253	0.035714286

c.) Equation of LWB: $y = 2 \times 10^{-7} x + 0.0108$

$\frac{1}{V_{max}}$: $y = 2 \times 10^{-7}(0) + 0.0108$

$y = 0.0108$

Therefore: $\frac{1}{0.0108} =$ **93 μmol/min = Vmax**

b.) $\frac{-1}{K_m}$: $0 = 2 \times 10^{-7} x + 0.0108$

$-0.0108 = 2 \times 10^{-7} x$

$x = -54000$

Therefore: $\frac{-1}{-54000} = .000019 =$ **1.9×10^{-5} M = K_m**

d.) Equation of LWB + Inhibitor: $y = 3 \times 10^{-7} x + 0.0357$

$\frac{1}{V_{max}}$: $y = 3 \times 10^{-7}(0) + 0.0357$

$y = .0357$

Therefore: $\frac{1}{0.0357} =$ **28 μmol/min = Vmax**

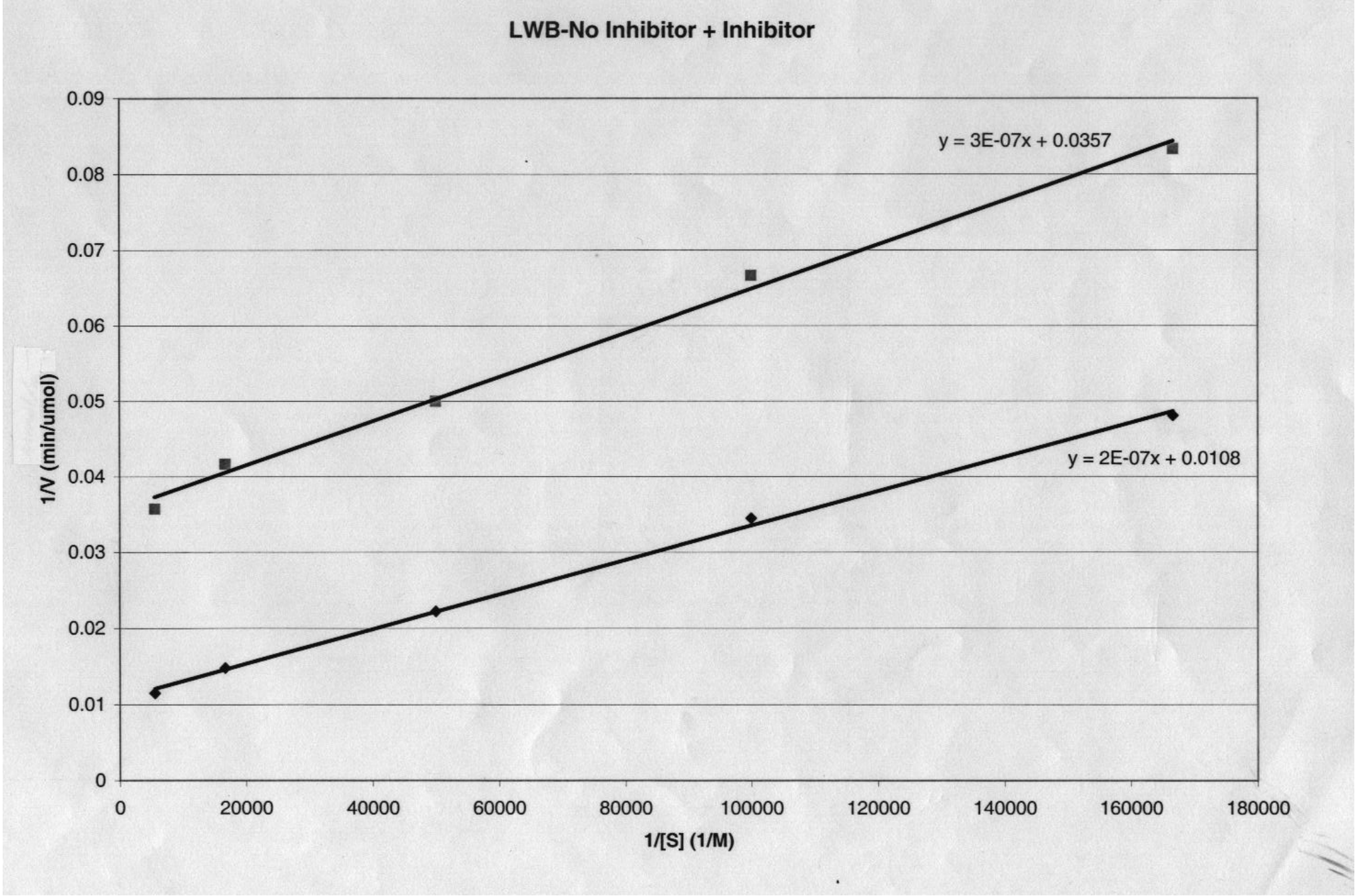
$\frac{-1}{K_m}$: $0 = 3 \times 10^{-7}(x) + .0357$

$-.0357 = 3 \times 10^{-7} x$

$x = -119000$

Therefore, $\frac{-1}{-119000} =$ **8.4×10^{-6} M = K_m**

e.) Vmax + km decrease, therefore it is an UN-COMPETITIVE inhibitor.
The effects of uncompetitive inhibitors cannot be overcome by increasing [S] b/c the it effectively ↑ the affinity for the substrate + the overall rate of the rxn goes down. Also I binds only after the substrate has already bound the enzyme.


LWB-No Inhibitor + Inhibitor
y = 3E-07x + 0.0357
y = 2E-07x + 0.0108
1/V (min/umol)
1/[S] (1/M)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0
20000
40000
60000
80000
100000
120000
140000
160000
180000

5a.) Michaelis-Menten Eq'n:

$$V_0 = \frac{V_{max}[S]}{K_M + [S]}$$ 0.5 pts

Lineweaver-Burke Eq'n:

$$\frac{1}{V_0} = \left(\frac{K_M}{V_{max}}\right)\left(\frac{1}{[S]}\right) + \frac{1}{V_{max}}$$ 0.5pts

b.) 1 pt for correct plot and labeled axes

c.) 1 pt for correct plot and labeled axes

1 pt for equations

d.) K_M is the Michaelis constant that is related to the affinity of the enzyme for the substrate 0.5pts

V_{max} is the maximum rate that can be observed in the reaction, where the substrate is in excess 0.5 pts

e.) Absence of Inhibitors:

$y = 0.564x + 0.07$

$V_{max} = \frac{1}{0.07} = \boxed{14.3 \text{ mmol/min}}$ 0.5 pts

$K_M = (0.564)(14.3) = \boxed{8.07 \text{ mM}}$ 0.5pts

Presence of Inhibitor A:

$y = 0.9113x + 0.1172$

$V_{max} = \frac{1}{0.1172} = \boxed{8.53 \text{ mmol/min}}$ 0.5pts

$K_M = (0.9113)(8.53) = \boxed{7.77 \text{ mM}}$ 0.5 pts

Presence of Inhibitor B:

$y = 2.123x + 0.0676$

$V_{max} = \frac{1}{0.0676} = \boxed{14.8 \text{ mmol/min}}$ 0.5pts

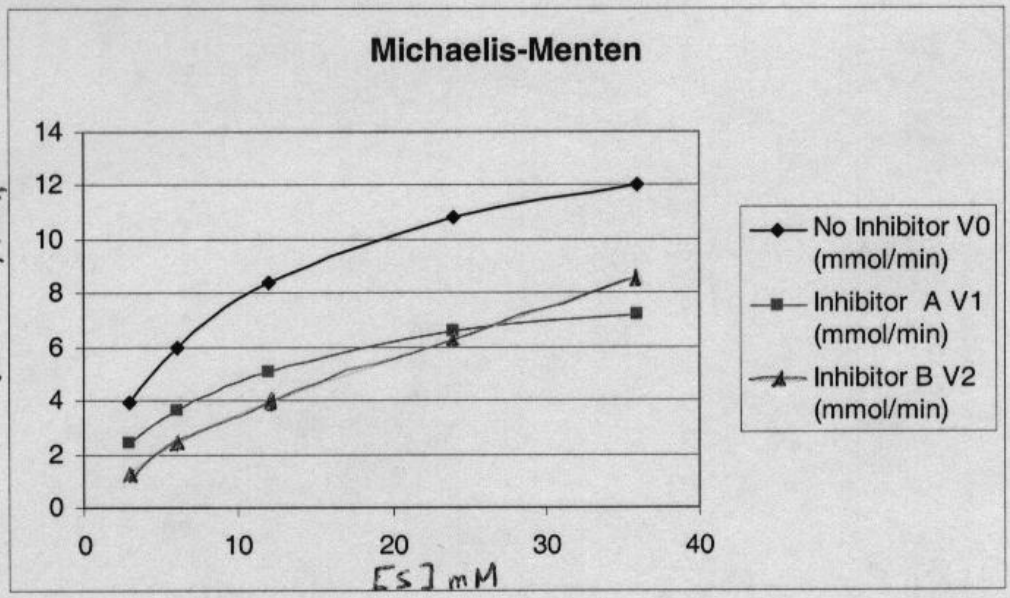
$K_M = (2.123)(14.8) = \boxed{31.4 \text{ mM}}$ 0.5pts

f.) Inhibitor A is non-competitive (V_{max} decreased & K_M stayed the same) 1pt

*Uncompetitive also accepted (V_{max} and K_M decreased)

Inhibitor B is competitive (V_{max} stays the same & K_M increases) 1pt

[S] mM	No Inhibitor V_0 (mmol/min)	Inhibitor **A** V_1 (mmol/min)	Inhibitor **B** V_2 (mmol/min)
3	3.9	2.4	1.29
6	6	3.6	2.4
12	8.4	5.1	3.9
24	10.8	6.6	6.3
36	12	7.2	8.55



[S] mM	No Inhibitor V_0 (mmol/min)	Inhibitor **A** V_1 (mmol/min)	Inhibitor **B** V_2 (mmol/min)
0.333333	0.25641	0.416667	0.775194
0.166667	0.166667	0.277778	0.416667
0.083333	0.119048	0.196078	0.25641
0.041667	0.092593	0.151515	0.15873
0.027778	0.083333	0.138889	0.116959