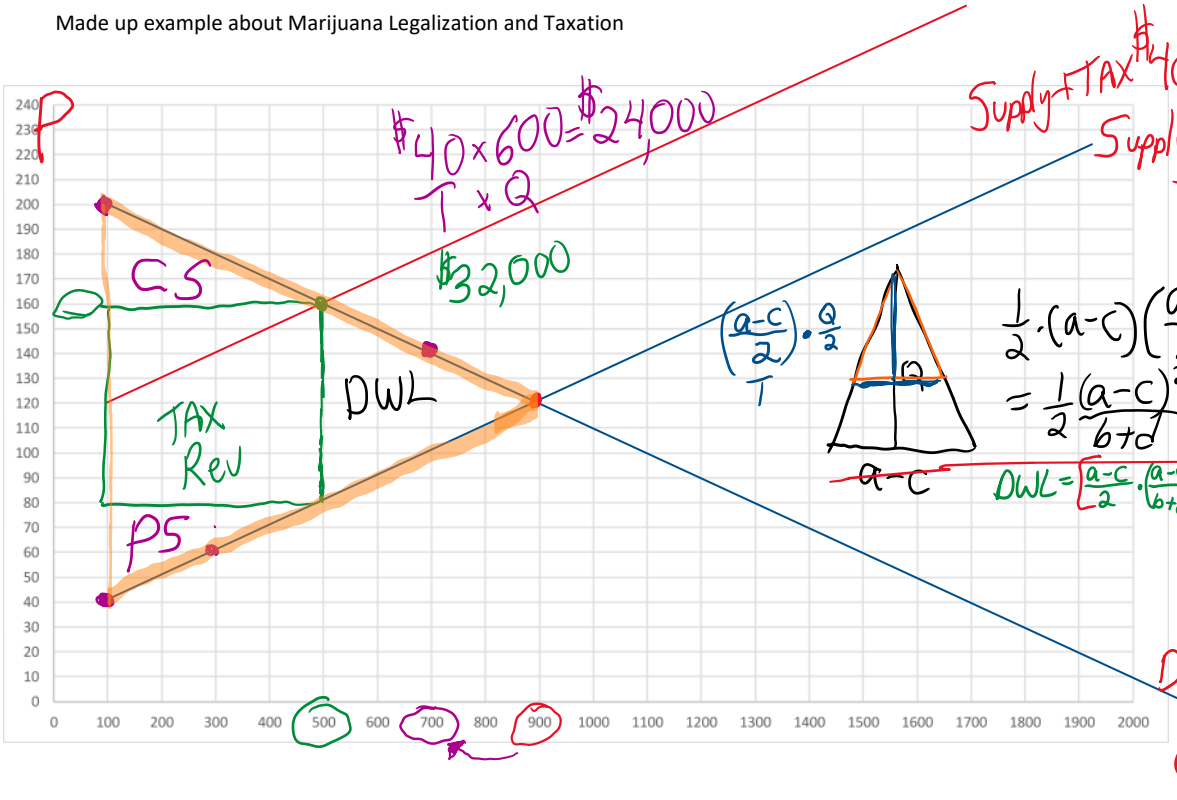
Economics fun with Basic Algebra and Calculus! Maximum Tax Revenue

Made up example about Marijuana Legalization and Taxation



$40×600=$24000

T×Q

$32,000

$\left(\frac{a-c}{2}\right)\cdot\frac{Q}{2}$

T

a-c

$\frac{1}{2}\cdot(a-c)\left(\frac{a-c}{b+d}\right)$

$=\frac{1}{2}\frac{(a-c)^2}{b+d}$ = Total Surplus

$\frac{1}{2}$ tax Rev

$\frac{1}{4}$ DWL

$\frac{1}{4}$ Surplus

$DWL=\left[\frac{a-c}{2}\cdot\left(\frac{a-c}{b+d}\right)\frac{1}{2}\right]\frac{1}{2}=\frac{1}{8}\frac{(a-c)^2}{b+d}$

Demand: P=200-0.1Q *(Inverse Demand)* Q=2000-10P	Demand P=a-bQ Q=a/b-(1/b)P
Supply: P=40+0.1Q +T Q=-400+10P	Supply P=c+dQ +T Q= -(c/d)+(1/d)P
Equilibrium: 200-0.1Q=40+0.1Q+T	Equilibrium: a-bQ=c+dQ +T $Q=\frac{a-c}{b+d}\quad P=\frac{ad+bc}{b+d}$ $Q=\frac{a-c}{b+d}-\frac{T}{b+d}$ $P=\frac{ad+bc}{b+d}+\frac{Tb}{b+d}$

Tax Revenue $T\cdot Q$

$\frac{160-T}{.2}=\frac{+.2Q}{.2}$

$800-5T=Q$

$TR=T\cdot(800-5T)$

$TR=800T-5T^2$ TR

$\frac{\partial TR}{\partial T}=800-10T=0$

$T=\$80$

$TR=T\cdot\left[\frac{a-c}{b+d}-\frac{T}{b+d}\right]$

$\frac{\partial TR}{\partial T}=\frac{a-c}{b+d}-\frac{2T}{b+d}=0$

$a-c-2T=0$

$T^*=\frac{a-c}{2}$

$Q^*=\frac{\left[\frac{a-c}{2}\right]}{b+d}=\left[\frac{a-c}{b+d}\right]\cdot\frac{1}{2}$

$T^*\cdot Q^*=TR=\left[\frac{a-c}{2}\right]\left[\frac{a-c}{b+d}\right]\frac{1}{2}$

$=\frac{(a-c)^2}{b+d}\cdot\frac{1}{4}$

MaxTax Blank

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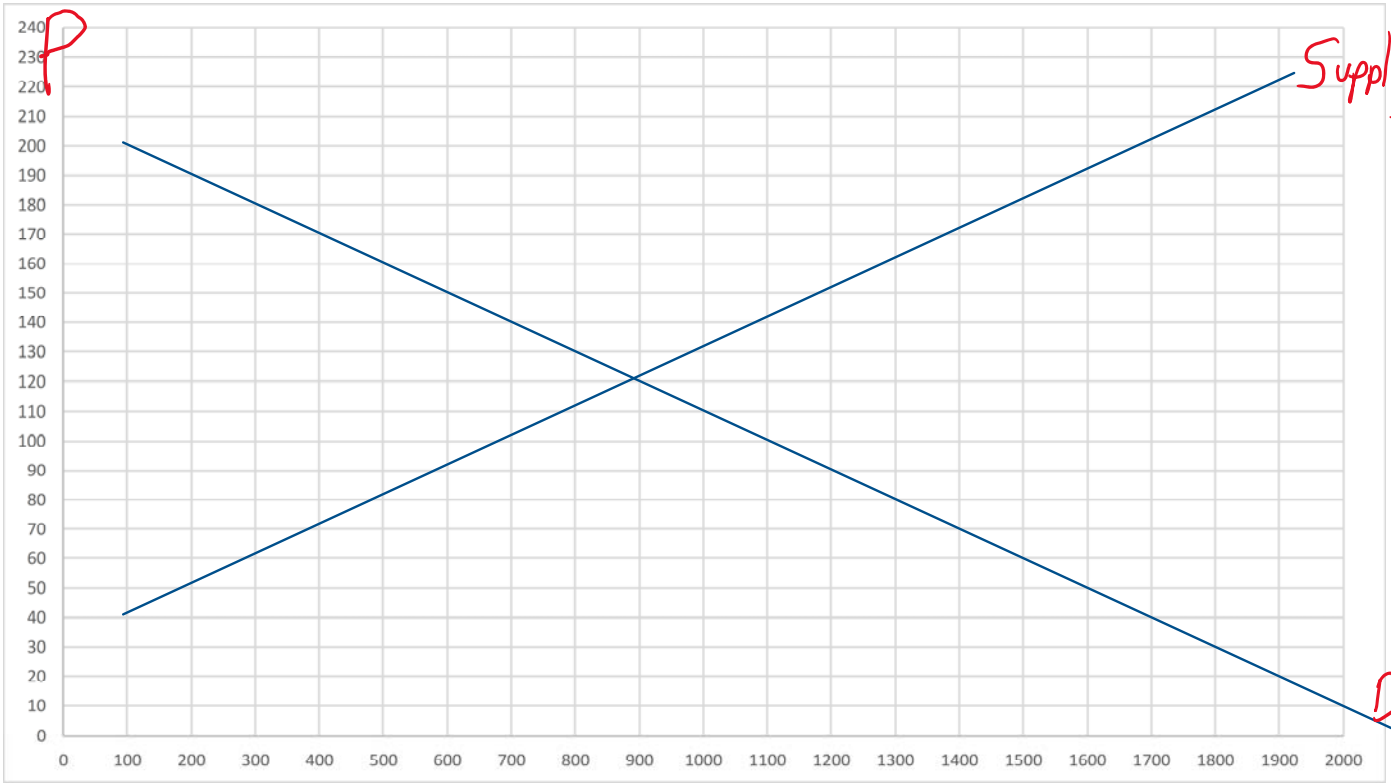

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Equilibrium: 200-0.1Q=40+0.1Q	Equilibrium: a-bQ=c+dQ $Q = \frac{a-c}{b+d}$ $P = \frac{ad+bc}{b+d}$