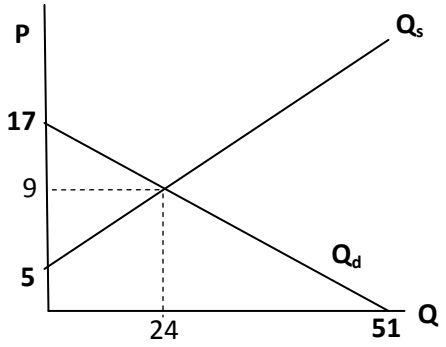
Answer Keys: Chapter1 Static Equilibrium Analysis in Economics

1. a) $y - 3x - 12 = 0$
   b) $y + x^2 + 2 + 5x = 0$
   c) $yx - 23 = 0$

2. a) Linear Function
   b)Quadratic Function
   c)Exponential Function
   d)Logarithm Function
   e)Rectangular hyperbola

3. $Q_d = Q_s$
   $51 - 3P = 6P - 30$
   $P^* = 9, Q^* = 24$



4. $Q = 30 - P$: Demand Curve (Show negative relation of Q and P)
   $Q = 5P - 6$: Supply Curve (Show positive relation of Q and P)
   $Q_d = Q_s$
   $P^* = 6 \quad Q^* = 24$

5. a) $Q_d = Q_s$
   $3 - P^2 = 6P - 4$
   $P^2 + 6P - 7 = 0$
   $(P+7)(P-1) = 0$
   $P = 1, -7$
   But P can't be negative number, so $P^* = 1, Q^* = 2$

   b) $Q_d = Q_s$
   $2P^2 - 10 = 0$
   $2(P - \sqrt{5})(P + \sqrt{5}) = 0$

P=$\sqrt{5}$, $-\sqrt{5}$

But P can't be negative number, so P*=$\sqrt{5} = 2.236$, Q*=3

c) $P_d=20 – 3Q - Q^2$

$P_s=3Q^2 – 10Q+5$

$P_d=P_s$

$4Q^2-7Q-15=0$

Q*=3, P*=2

6. $Q_{d1}=18-3P_1+P_2$ and $Q_{s1}=-2+4P_1$

So, $Q_{d1}=Q_{s1}$, $-2+4P_1=18-3P_1+P_2$

$7P_1 – P_2=20$ -----1)

$Q_{d2}=12+P_1-2P_2$ and $Q_{s2}=-2+3P_2$

So, $Q_{d2}=Q_{s2}$, $12+P_1-2P_2 =-2+3P_2$

$P_1 -5P_2= -14$ -----2)

Solve 1) and 2), P_1*=3.35 and P_2*=3.47

7. a) Before taxation; $Q_d= Q_s$

$-3P+51=6P – 30$

P*= 9 , Q*= 24

b) After taxation; Imposing an excise tax of 2baht per unit.

$Q_d= -3P+51$

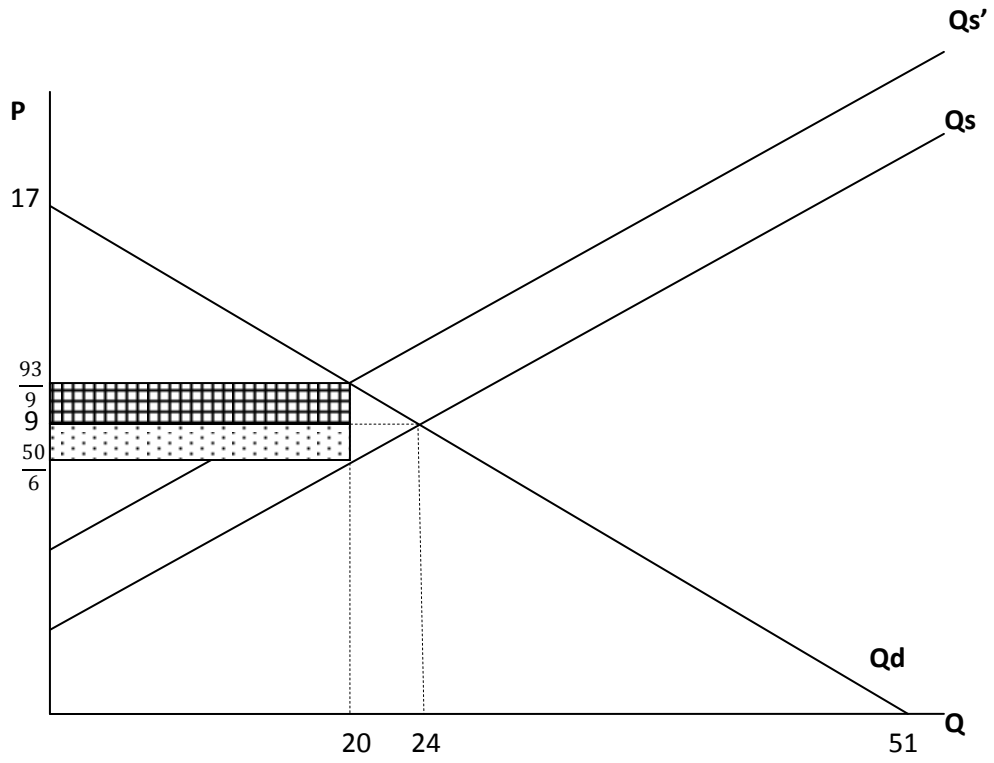
$Q_s'= 6(P – 2) – 30 =6P – 42$

Then, $Q_d= Q_s'$

P'*= $\frac{93}{9}$= 10.33

Q'*= 20

c)



Taxes paid by buyer = $(\frac{93}{9} - 9) \times 20 = 26.67$

Taxes paid by sellers = $(9 - \frac{50}{6}) \times 20 = 13.33$

d) Government tax revenue = taxes paid by buyers + taxes paid by sellers

= 26.67+13.33

=40

8. a) Endogenous variables: Y,C,T

   Exogenous variables: I,G

   b) B is Marginal Propensity to Consume (MPC) which is the change in consumption due to the change in disposable income.

   c) $Y=a+b(Y-T)+I_0+G_0$

   $Y-bY=a-bT+I_0+G_0$

   $Y^*=\frac{a-bT+I_0+G_0}{1-b}$

9. $Y = 25+6Y^{1/2}+16+14$

$Y-6Y^{1/2} – 55 = 0$

$(Y^{1/2} – 11)(Y^{1/2} +5) =0$

$Y^{1/2}=11, -5$

$Y^*= 11^2=121$ (Y* can't be negative)

Then, $C^*= 25+6(11)=91$

10. $Y=150+0.75(Y-10-0.2Y)+1160 – 30R+935$

$0.4Y=2237.5 – 30R$

$Y=5593.75 – 75R$: IS curve

11. Parameters: a,b,c,d,k

Endogenous variables: Q_d^x, Q_s^x, P_x

Exogenous variables: P_y

12. $M_d=M_s$

$1200+0.5Y-50R=200$

$Y=100R – 2000$: LM curve

13. LM curve

$875+0.25Y- 25R=2000$

$Y= 4500+100R$

IS curve

$Y=250+0.5(Y-20)+1000 – 20R+1200+3160 – 100 – 0.3Y$

$Y=5500+0.25Y – 20R$

$Y=6875 – 25R$

Equilibrium in Economy: IS=LM

$4500+100R=6875-25R$

$125R=2375$

$R^*=19$

$Y^*=4500+100(19)=6400$