NOTE: it does not matter whether the tax is imposed on buyers or sellers; the result will be the same

Tax Practice

comp. Eq

$40 - p = p$

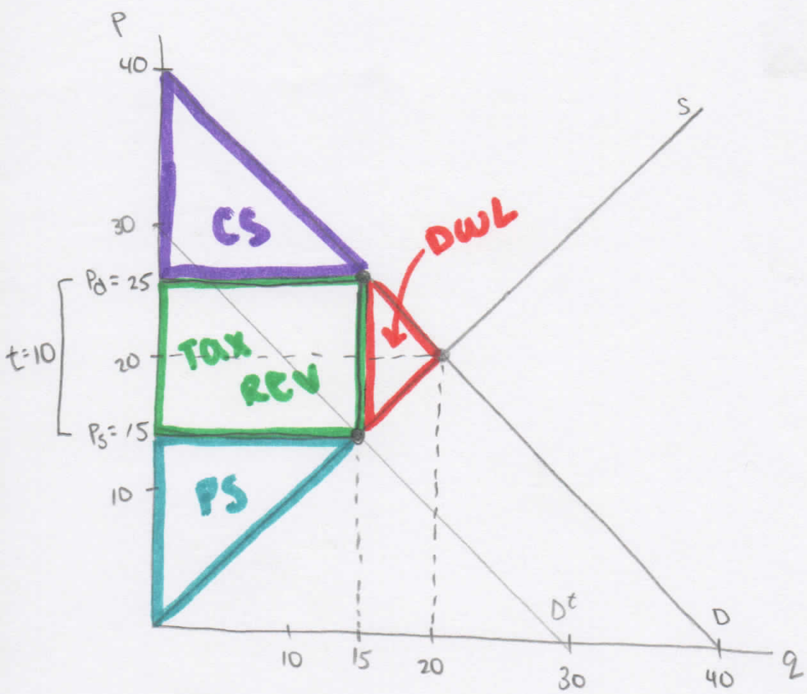
$40 = 2p$

$p = 20$

$q = 40 - 20$

$q = 20$

I. Demand: q = 40 – p
Supply: q = p
Tax = $10 per unit
Find p_d, p_s, q, CS, PS, total welfare, and DWL after the tax. In addition, determine what percentage of the tax is paid by consumers and what percentage of the tax is paid by producers.



TAX REV $= (10 \times 15) = \boxed{\$150}$

DWL $= \frac{1}{2}(10)(5) = \boxed{\$25}$

CS $= \frac{1}{2}(15)(15) = \boxed{\$112.50}$

PS $= \frac{1}{2}(15)(15) = \boxed{\$112.50}$

Total welfare = CS + PS + TAX REV = $\boxed{\$375}$

Original equilibrium price = $20
Demander's price increases by $5 after tax; supplier's price falls by $5

Demanders pay: $\frac{\$5}{\$10} \rightarrow \boxed{50\%}$ Suppliers pay: $\frac{\$5}{\$10} \rightarrow \boxed{50\%}$

METHOD 1: Shift Demand

Demand	→ Inverse	→ shift down by tax
$q = 40 - p$	$p = 40 - q$	$p = 40 - q - 10$
		$p = 30 - q$

Find intersection of shifted demand & inverse supply

$30 - q = q$

$30 = 2q$

$\boxed{q = 15}$

Plug q to inverse demand → P_d

$p = 40 - 15$

$\boxed{P_d = 25}$

Plug q to inverse supply → P_s

$\boxed{P_s = 15}$

METHOD 2: $P_d - t = P_s$

$P_d = 40 - q$ $P_s = q$

$40 - q - t = q$

$40 - q - 10 = q$

$30 - q = q$

$\boxed{q = 15}$

Plug q to inverse demand → P_d

$\boxed{P_d = 25}$

Plug q to inverse supply → P_s

$\boxed{P_s = 15}$

comp Eq

$36 - 2p = 4p - 12$

$48 = 6p$

$p = 8$

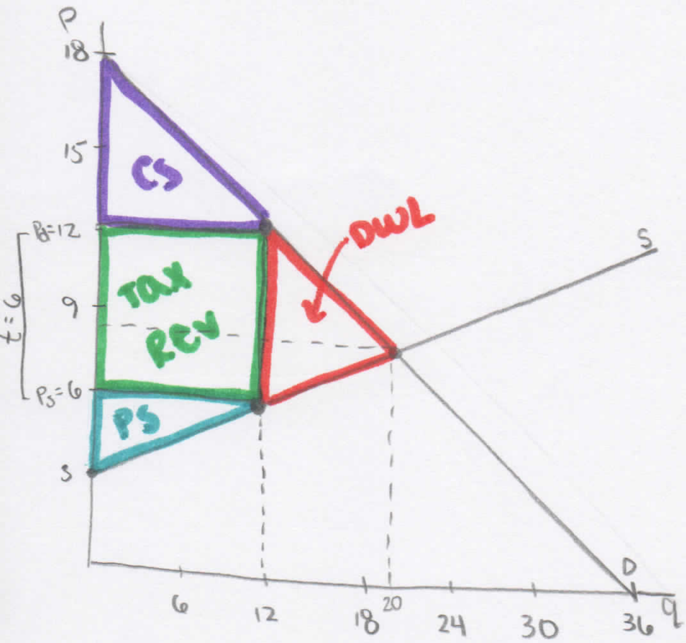
$q = (4 \times 8) - 12$

$q = 20$

II. Inverse demand: $p = 18 - 0.5q$
Supply: $q = 4p - 12$
Tax = \$6 per unit
Find p_d, p_s, q, CS, PS, total welfare, and DWL after the tax. In addition, determine what percentage of the tax is paid by consumers and what percentage of the tax is paid by producers.

Demand: $q = 36 - 2p$

Inverse supply: $p = \frac{q}{4} + 3$



Tax Rev = $(6 \times 12) = \boxed{\$72}$

DWL = $\frac{1}{2}(6)(8) = \boxed{\$24}$

CS = $\frac{1}{2}(6)(12) = \boxed{\$36}$

PS = $\frac{1}{2}(3)(12) = \boxed{\$18}$

Total welfare = CS + PS + Tax Rev = $\boxed{\$126}$

Original equilibrium price = \$8

Demander's price increases by \$4 after tax; supplier's price falls by \$2

Demanders pay: $\frac{\$4}{\$6} \rightarrow \boxed{66.7\%}$

Suppliers pay: $\frac{\$2}{\$6} \rightarrow \boxed{33.3\%}$

$P_d - t = P_s$

$P_d = 18 - \frac{q}{2}$

$P_s = \frac{q}{4} + 3$

$18 - \frac{q}{2} - 6 = \frac{q}{4} + 3$

$9 = \frac{3q}{4}$

$\boxed{q = 12}$

Plug q to inverse demand → P_d

$p = 18 - \frac{1}{2}(12)$

$\boxed{P_d = 12}$

Plug q to inverse supply → P_s

$p = \frac{1}{4}(12) + 3$

$\boxed{P_s = 6}$

Comp. EQ

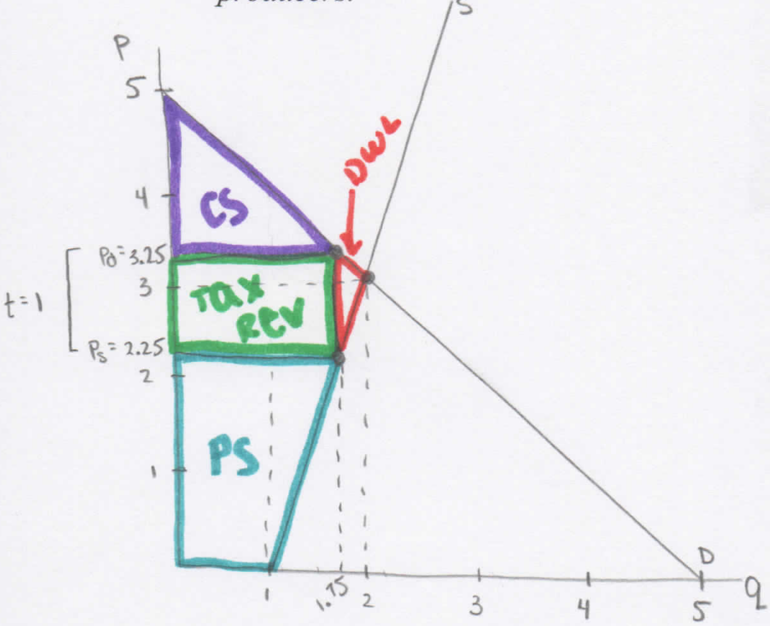
$5 - q = 3q - 3$

$8 = 4q$

$q = 2$

$p = 5 - 2 \rightarrow p = 3$

III. Demand: $q = 5 - p$ Inverse: $p = 5 - q$
Inverse Supply: $p = 3q - 3$ supply: $q = \frac{p}{3} + 1$
Tax = $1 per unit
Find p_d, p_s, q, CS, PS, total welfare, and DWL after the tax. In addition, determine what percentage of the tax is paid by consumers and what percentage of the tax is paid by producers.



Tax Rev = $(1 \times 1.75) = \boxed{\$1.75}$

DWL = $\frac{1}{2}(1)(0.25) = \boxed{\$0.125}$

CS = $\frac{1}{2}(1.75)(1.75)$

$\boxed{= \$1.53}$

PS = $(2.25 \times 1) + \frac{1}{2}(2.25)(0.75)$

$\boxed{= \$3.09}$

$P_d - t = P_s$

$P_d = 5 - q$ $P_s = 3q - 3$

$5 - q - 1 = 3q - 3$

$7 = 4q$

$\boxed{q = 1.75}$

Plug q to inverse demand $\rightarrow P_d$

$P = 5 - 1.75$

$\boxed{P_d = 3.25}$

Plug q to inverse supply $\rightarrow P_s$

$P_s = 3(1.75) - 3$

$\boxed{P_s = 2.25}$

Total welfare = CS + PS + Tax Rev = $\boxed{\$6.37}$

Original Equilibrium price = $3

Demander's price increases by $0.25 after tax; supplier's price falls by $0.75

Demanders pay: $\frac{\$0.25}{\$1} \rightarrow \boxed{25\%}$

Suppliers pay: $\frac{\$0.75}{\$1} \rightarrow \boxed{75\%}$