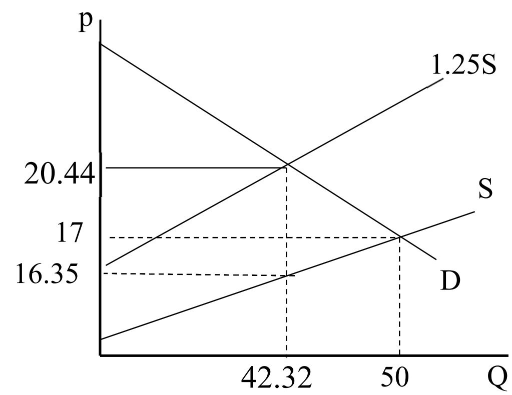
4. At the current market equilibrium, price is \$17 and quantity is 50. A tax of 25% is imposed. The elasticity of demand is -0.75 and the elasticity of supply is 4. Find the new equilibrium quantity, the after tax price paid by consumers, the after tax price received by suppliers, tax revenue, the producer burden, the consumer burden, and the excess burden. Draw a figure to illustrate. Hint: It will help to sketch the figure noting what you know and what you need to figure out before starting the algebra!



1) Using the elasticity of demand:

$[(Q-50)/50]/[(p_d-17)/17]=-0.75$

$Q-50=-0.75(p_d-17)(50/17)$

$Q=50-2.21p_d+37.5$

$Q=87.5-2.21p_d$

2) Using the elasticity of supply:

$[(Q-50)/50]/[(p_s-17)/17]=4$

$Q-50=4(p_s-17)(50/17)$

$Q=50+11.76p_s-200$

$Q=-150+11.76p_s$

3) We know

$1.25p_s= p_d$

4) Solving by substitution

$-150+11.76p_s = 87.5-2.21\times1.25p_s$

$14.52p_s = 237.5$

$p_s=16.35$

$pd= 1.25p_s=20.44$

$Q=42.32$

5) Label the figure accordingly.

6) Find the tax revenue and burdens

Revenue=$0.25\times16.35\times42.32=173.03$

CB=$(20.44-17)\times42.32=145.69$

PB=$(17-16.35)\times42.32=27.34$

EB=$(20.44-16.35)(50-42.32)/2=15.69$