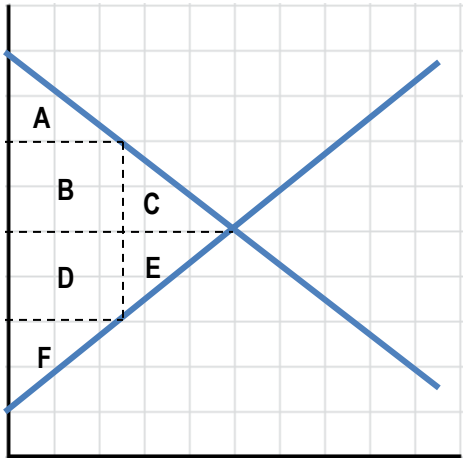
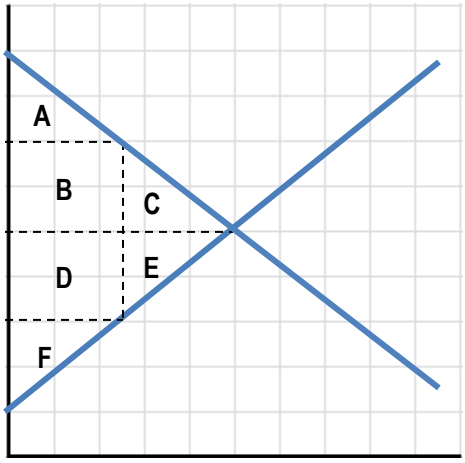
CONCEPT: QUANTITATIVE ANALYSIS OF PRICE CEILINGS AND PRICE FLOORS: FINDING AREAS

● We are sometimes asked to calculate consumer and producer surplus using algebra.

Price Floor



Price Ceiling

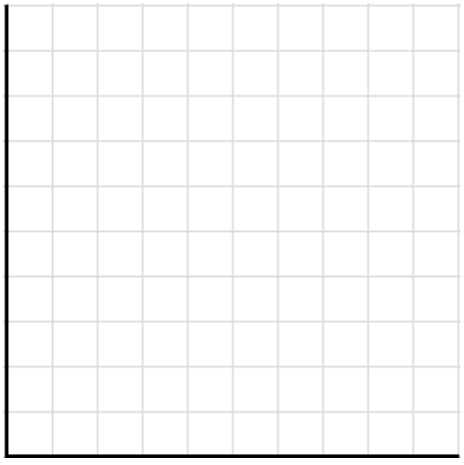


	Equilibrium	Price Floor	Price Ceiling
Consumer Surplus			
Producer Surplus			
Deadweight Loss			

□ Calculating Areas (steps 1-3, we've done these before!):

- Step 1: Find Equilibrium Price and Quantity by setting $Q_D = Q_S$
- Step 2: Confirm that the price floor/ceiling is "effective." If not effective, use equilibrium!
  - > A price ceiling must be _____ equilibrium price to be effective
  - > A price floor must be _____ equilibrium price to be effective
- Step 3: Find the "axis price" when $Q_D = 0$ and the "axis price" when $Q_S = 0$

EXAMPLE: Calculate consumer surplus, producer surplus, and deadweight loss if a price ceiling of $1,000 is in effect.



$Q_D = 3{,}000{,}000 - 1{,}000P$ $Q_S = 1{,}300P - 450{,}000$

□ Calculating Areas (steps 4 - 6, New Steps!):

- Step 4: Find the "floor/ceiling quantity" by plugging "floor/ceiling price" into the correct equation
  > For floors: Use demand equation and "floor/ceiling price"
  > For ceilings: Use supply equation and "floor/ceiling price"
- Step 5: Find "missing price" at the "floor/ceiling quantity"
  > For floors: Use supply equation and "floor/ceiling quantity" to calculate "missing price"
  > For ceilings: Use demand equation and "floor/ceiling quantity" to calculate "missing price"
- Step 6: Calculate Consumer and Producer Surplus and Deadweight Loss using the following equations

$Area\ of\ a\ triangle = \frac{1}{2} * base * height$	$Area\ of\ a\ Rectangle = base * height$

EXAMPLE: Calculate consumer surplus, producer surplus, and deadweight loss if a price ceiling of $1,000 is in effect.

$Q_D = 3{,}000{,}000 - 1{,}000P$ $Q_S = 1{,}300P - 450{,}000$

Consumer Surplus:	Producer Surplus:	Deadweight Loss:

NOTE: You may not need all the steps if asked for only consumer surplus or producer surplus or deadweight loss. Use the graph to see what information you need!

PRACTICE: The supply and demand curves for a product are as follows. What is producer surplus if a price floor of $21 is set?

a) 6.25
b) 10.5
c) 12.5
d) 13.5
e) 18

$Q_D = 45 – 2P$

$Q_S = -15 + P$

PRACTICE: The supply and demand curves for a product are as follows. What is deadweight loss if a price ceiling of $2 is set?

a) 150
b) 187.5
c) 212.5
d) 300
e) 375

$Q_D = 600 – 100P$

$Q_S = -150 + 150P$