

# PS # 5 Answers

$$(1) \quad 100 - 2P = 20 + 6P$$

$$8P = 80$$

$$P = 10$$

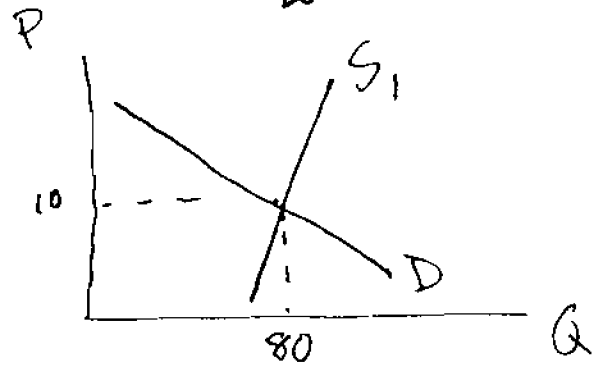
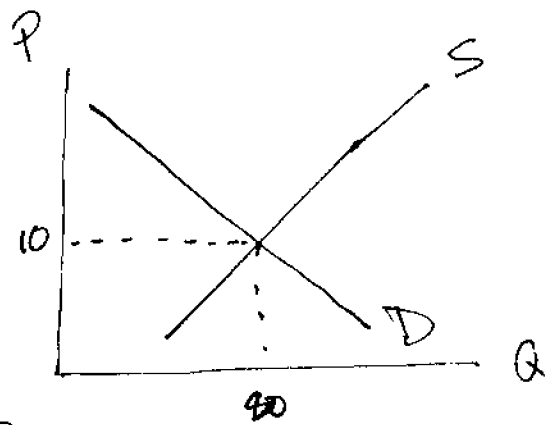
$$Q = 80$$

$$100 - 2P = 70 + P$$

$$3P = 30$$

$$P = 10$$

$$Q = 80$$



$$(2) \quad 1000 - 5P = 4P - 80$$

$$1080 = 9P$$

$$P = 120$$

$$Q = 400$$

$$DD: P = -\frac{1}{5}Q + 200$$

$$SS: P = \frac{1}{4}Q + 20$$

$$CS = \frac{1}{2} (400)(200 - 120)$$

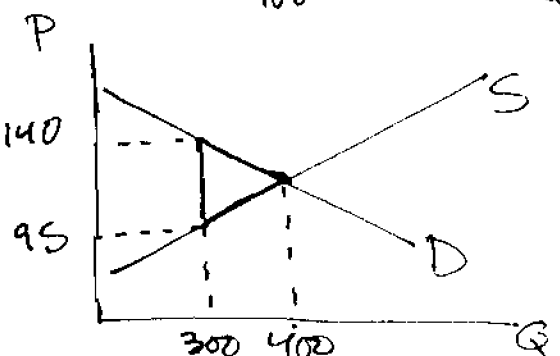
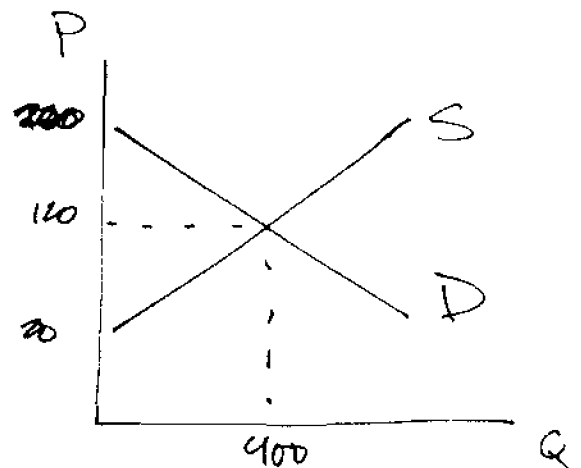
$$= 16,000$$

$$PS = \frac{1}{2} (400)(120 - 20)$$

$$= 20,000$$

$$DWL = \frac{1}{2} (140 - 95)(100)$$

$$= 2,250$$



$$\text{if } P = 140$$

$$CS = \frac{1}{2} (300)(200 - 140) \\ = 9000$$

$$PS = \frac{1}{2} (300)(95 - 20) \\ + (140 - 95)(300) \\ = 24,750$$

$$\text{if } P = 95$$

$$CS = \frac{1}{2} (300)(200 - 140) \\ + (140 - 95)(300) \\ = 22,500$$

$$PS = \frac{1}{2} (300)(95 - 20) \\ = 11,250$$

$$\text{if } Q = 450$$

$$P = -\frac{1}{5}Q + 200 \\ = -\frac{1}{5}(450) + 200 \\ = 110$$

$$P = \frac{1}{4}Q + 20 \\ = 132.5$$

total loss is

$$\frac{1}{2} (132.5 - 110)(50) \\ = 562.5$$

$$1270 - SP = 4P - 80$$

$$1350 - 1190 = 4P$$

$$P = 150$$

$$Q = 520$$

$$CS = \frac{1}{2} (254 - 150)(520)$$

$$= 27,040$$

$$PS = \frac{1}{2} (150 - 20)(520)$$

$$= 33,800$$

what if govt restricts

$$P = 120$$

$$PS = \frac{1}{2} (120 - 20)(400)$$

$$= 20,000$$

of that

$$(150 - 120)(400) = 12,000$$

is transferred to consumers

$$\frac{1}{2} (150 - 120)(120) = 1,800$$

is lost

(3)

$$Q_s = \sum_{i=1}^{1000} q_i$$

$$= 1000(100)$$

$$= 100,000$$

$$160,000 - 10,000P = 100,000$$

$$60,000 = 10,000P$$

$$P = 6$$

$$Q_s' = 999(100)$$

$$= 99,900$$

$$160,000 - 10,000P = 99,900$$

$$60,100 = 10,000P$$

$$P = 6.01$$

one firm has a small effect  
on the market price

$$(4) \quad P = q + 10$$

$$q = P - 10$$

$$Q = 100q \\ = 100P - 1000$$

$$100P - 1000 = 1100 - 50P$$

$$150P = 2100$$

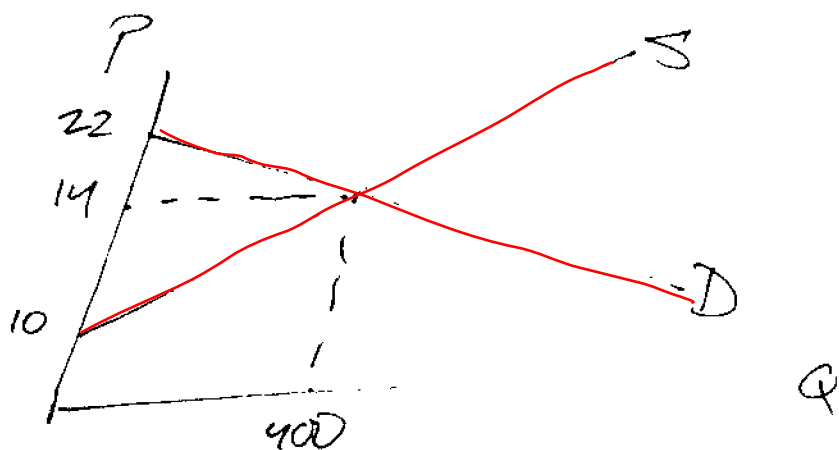
$$P = 14$$

$$Q = 400$$

$$\pi = TR - TC$$

$$= 4(14) - (8 + 40 + 5)$$

$$= 3$$



$$CS = \frac{1}{2}(400)(22 - 14) \\ = 1600$$

$$PS = \frac{1}{2}(400)(14 - 10) \\ = 800$$

$$\text{total profit} = 3 \times 100 = 300$$

$$SRFC = 5 \times 100 = 500$$

$$300 + 800 = 1100 = PS$$

taxes

$$DD: Q = 1100 - 50(P+3)$$

$$950 - 50P = 100P - 1050$$

$$P = 13$$

$$P+3 = 16$$

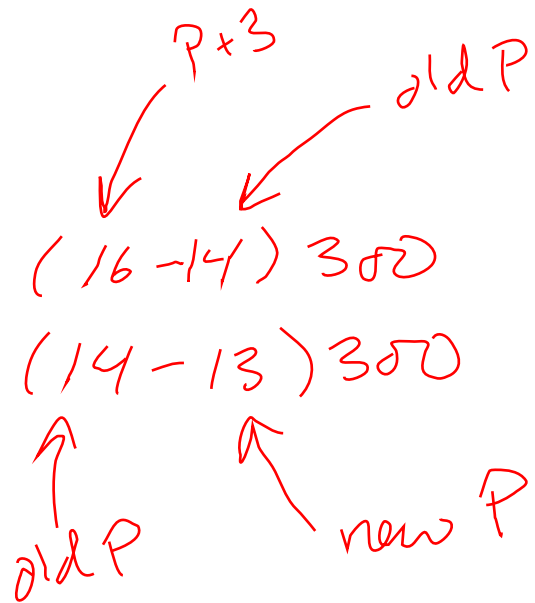
$$Q = 300$$

$$\text{Tax} = 3 \times 300 = 900$$

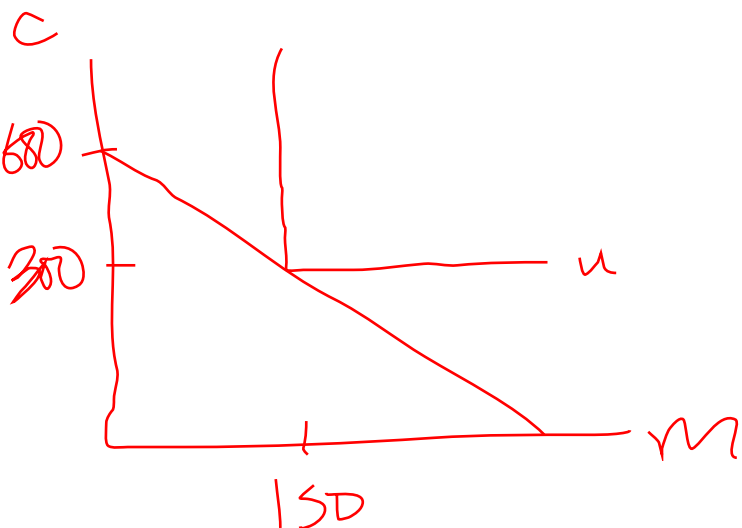
$$\text{consumers pay } 600 = (16 - 14) 300$$

$$\text{firms pay } 300 = (14 - 13) 300$$

$$\text{PS} = \frac{1}{2} (13 - 10) (300) \\ = 450$$



$$(5) C + 2m = 600$$



$$u = \min(C, 2m)$$

$$C = 2m$$

$$2m + 2m = 600$$

$$m = 150$$

$$C = 300$$

$$\text{slope} = -\frac{P_m}{P_c} = -2$$

$$\Rightarrow P_m = 2P_c$$