

**11. Incorrect The answer is true not false.** The monopolist should produce where

$$(1-t_p)MR - MC = 0$$

$$(1-0.1)*(118.75 - 4Q) - 3Q^2 + 50Q - 200 - 2 = 0$$

$$-3Q^2 + 46.4Q - 93.125=0$$

This equation has two solutions  $Q_1 = 2.37$  and  $Q_2 = 13.10$ .

Second order conditions are

$$(1-t_p)dMR/dQ - dMC/dQ < 0$$

$$(1-0.1)*(-4) - 3*2*2.37 + 50 = 32.179 > 0 \text{ (min) and}$$

$$(1 - 0.1)*(-4) - 3*2*13.10 + 50 = -32.179 < 0 \text{ (max).}$$

Price at maximum quantity =  $118.75 - 2*13.10 = \$92.56$ .

Economic profits =  $P*Q - TC - (t*P*Q) = P*Q - Q^3 + 25Q^2 - 200Q - (t*P*Q)$

$$= 92.56*13.10 - 13.10^3 + 25*13.10^2 - 200*(13.10) - 0.1*92.56*13.10$$

$$= 1212.54 - 577.84 - 121.25 = 513.45.$$

Government revenues =  $(t*P*Q) = 0.1*92.56*13.10 = 121.25$ .

Social welfare = consumer surplus + profits + tax =

$$(118.75 - 92.56)*13.10*0.5 + 513.45 + 121.25 = 806.24.$$