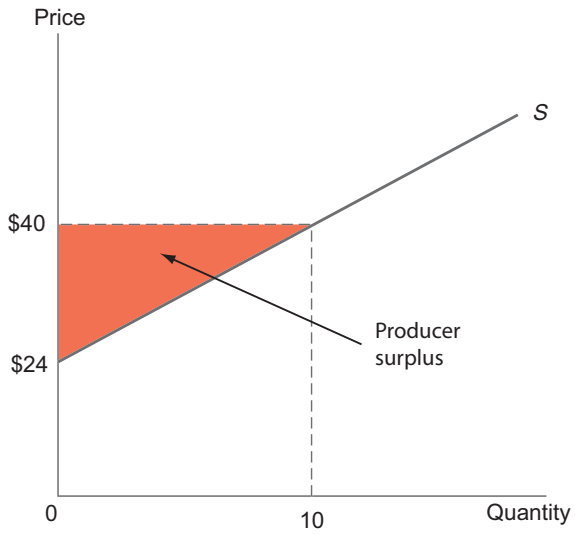
2. (a) Since elasticity $= (\Delta q/\Delta p)(p/q)$

$$2.5 = (\Delta q/\Delta p)(40/10) \quad \Rightarrow \quad (\Delta q/\Delta p) = 0.625$$

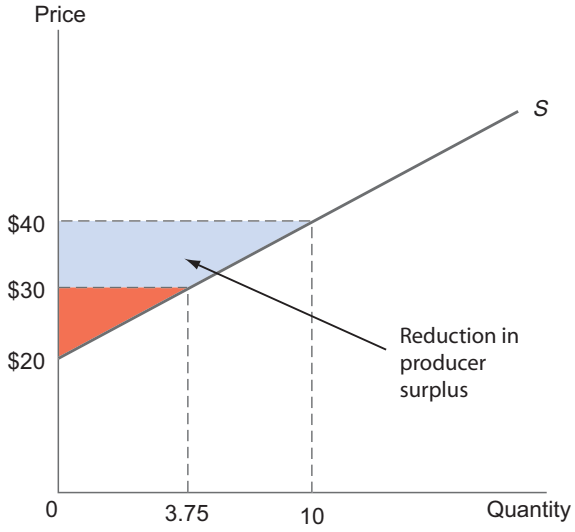
which is the slope of the supply schedule. Assuming linearity, $q = a + 0.625p$. At the market equilibrium: $10 = a + (0.625)(40)$; therefore, $a = -15$ and the supply schedule is $q = -15 + 0.625p$.

(b) See figure below:



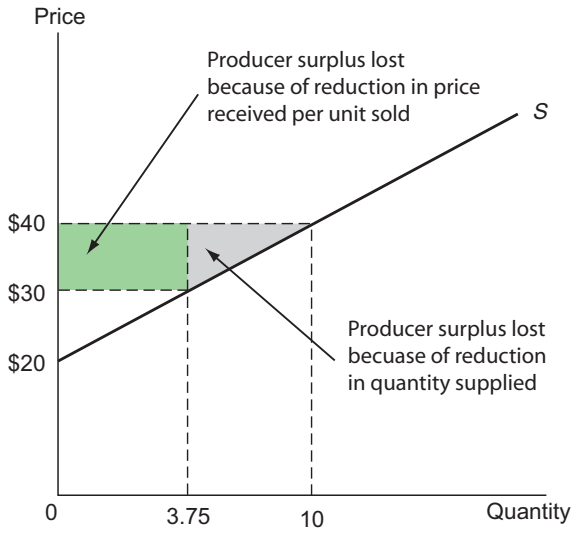
So the producer surplus is $(0.5)(10)(40 - 24) = \$80$.

(c) Using the supply schedule, we see that at a price of \$30, the quantity supplied falls to $q = -15 + 0.625(30) = 3.75$ units. The resulting change in PS is shown in the figure below.



So PS falls by $(40 - 30)((10 + 3.75)/2) = \$68.75$.

(d) See the diagram below.



We see that the loss in producer surplus due to the price change is $(\$40 - \$30)(3.75) = \$37.5$, which is $(\$37.5/\$68.75) \times 100 = 54.54\%$ of the total reduction in PS; therefore, and the quantity change accounts for the remaining $100\% - 54.54\% = 45.45\%$ reduction in PS.