1. (a) We have

$$\begin{aligned} q &= 6 - 0.5p + 0.0002I \\ &= 6 - 0.5p + 0.0002(60,000) \\ &= 6 - 0.5p + 12 \\ &= 18 - 0.5p \end{aligned}$$

The choke price is the price at which $q = 0$.

$$0 = 18 - 0.5p \quad \Rightarrow \quad p = \$36$$

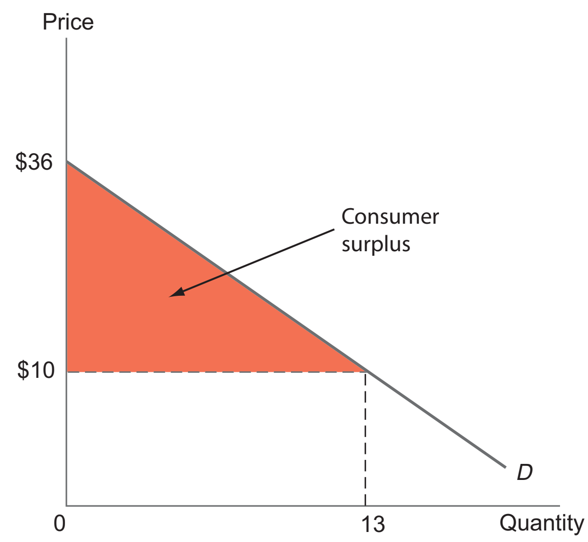
(b)

$$q = 18 - 0.5(10) = 13$$

So if the market price is \$10, the person will demand 13 gizmos.

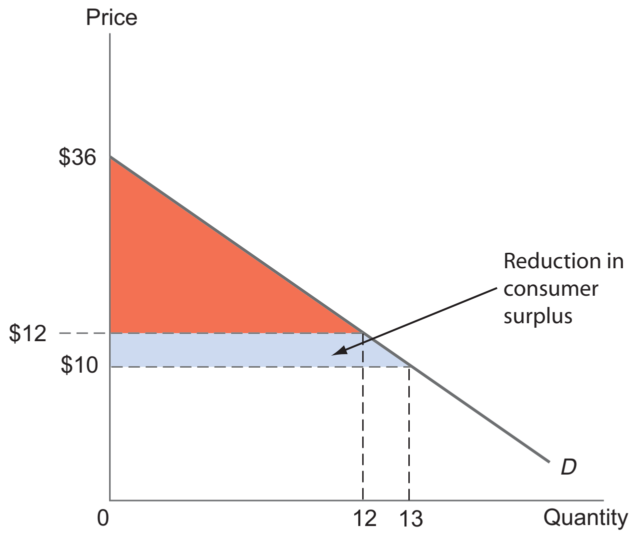
(c) Price elasticity of demand equals $(\Delta q/\Delta p)(p/q)$. For a linear demand schedule, such as the one used in this problem, $(\Delta q/\Delta p)$ is the slope of the demand schedule, which in this exercise is -0.5. Therefore, the price elasticity of demand is $(-0.5)(10/13) = -5/13 = -0.384$. That is, when price equals \$10, a one percent rise in price results in a 0.384 percent reduction in quantity demanded. Note that for a linear demand schedule, the price elasticity of demand is not constant—its absolute value increases as price increases.

(d) See the diagram below.



Consumer surplus is the triangle under the (inverse) demand curve and above the price. The height of the triangle is the choke price minus the market price $(36 - 10 = 26)$ and the base is the amount demanded (13). The area of the triangle is $0.5 \times 26 \times 13 = \$169$.

(e) See the diagram below.



A price rise to \$12 reduces demand to 12 gizmos. The new consumer surplus is $0.5 \times (36 - 12) \times 12 = \$144$. The reduction in consumer surplus, therefore, is $\$169 - \$144 = \$25$.

(f) Repeating the above calculation for an income of \$80,000, we find that the reduction in consumer surplus is \$33.