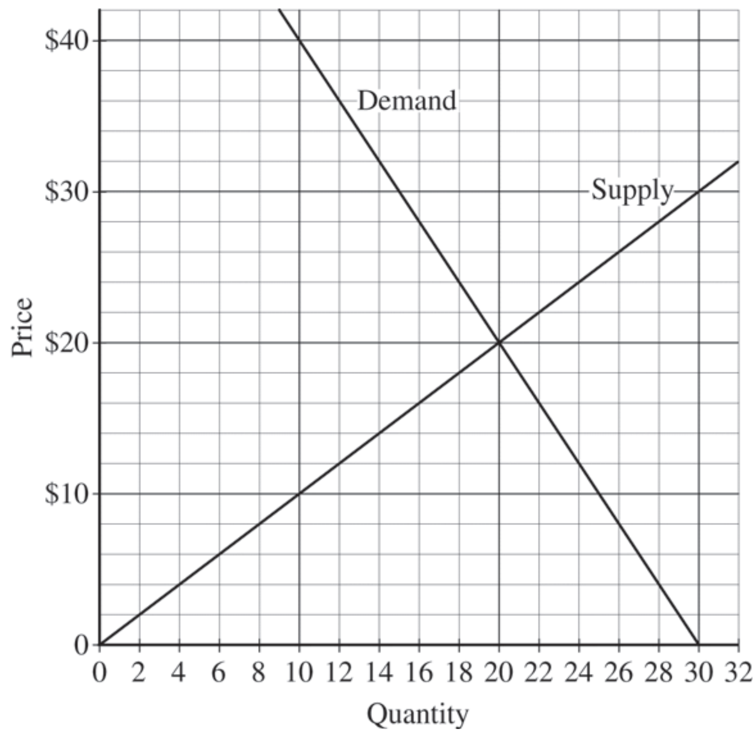
3. The graph below shows the market for widgets. The government is considering intervening in this market.



(a) Calculate the total producer surplus at the market equilibrium price and quantity. Show your work.

(b) If the government imposes a price floor at \$16, is there a shortage, a surplus, or neither? Explain.

(c) If instead the government imposes a price ceiling at \$12, is there a shortage, a surplus, or neither? Explain.

(d) If instead the government restricts the market output to 10 units, calculate the deadweight loss. Show your work.

(e) Assume the price decreases from \$20 to \$12.
   (i) Calculate the price elasticity of demand. Show your work.
   (ii) In this price range, is demand perfectly elastic, relatively elastic, unit elastic, relatively inelastic, or perfectly inelastic?

STOP

END OF EXAM

Question 3

6 points (1+1+1+1+2)

(a) 1 point:

- One point is earned for calculating the total producer surplus as $(1/2 \times 20 \times 20) = \$200$.

(b) 1 point:

- One point is earned for stating that imposing a price floor at $16 is ineffective and will not create a surplus or a shortage in the market because it is set below the equilibrium price, or because it is not binding.

(c) 1 point:

- One point is earned for stating that imposing a price ceiling at $12 will create a shortage because quantity demanded is greater than quantity supplied, or because the price ceiling is binding.

(d) 1 point:

- One point is earned for calculating the deadweight loss as $150 and for showing:

$(1/2 \times 30 \times 10)$
or
$(1/2 \times 10 \times 10) + (1/2 \times 20 \times 10)$
or
$\$50 + \$100$

(e) 2 points:

- One point is earned for calculating the price elasticity of demand as $[(24-20)/20 / (12-20)/20] = -0.5$, or for correctly using the midpoint formula.
- One point is earned for stating that in this price range the demand is relatively inelastic.