

3. The demand curve for a product has equation $p = 100e^{-0.008q}$ and the supply curve has equation $p = 4\sqrt{q} + 10$ for $0 \leq q \leq 500$, where q is quantity and p is price in dollars per unit.

(a) At a price of \$50 per unit, what quantity are consumers willing to buy and what quantity are producers willing to supply? Will the market push prices up or down?

(b) Find the equilibrium price and quantity. Does your answer to part (a) support the observation that market forces tend to push prices closer to the equilibrium price?

(c) Calculate and interpret the consumer and producer surplus at equilibrium.