

7. The Ministry of Tourism in the Republic of Palau estimates that the demand for its scuba diving tours is given by $Q^D = 6,000 - 20P$, where Q is the number of divers served each month and P is the price of a two-tank dive. The supply of scuba diving tours is given by $Q^S = 30P - 2,000$.
- Solve for the equilibrium price and quantity.
 - Find the value of the consumer surplus received by divers visiting Palau. (*Hint:* It may help to draw a graph.)
 - Find the value of producer surplus received by dive shops. (*Hint:* It may help to draw a graph.)
 - Suppose that the demand for scuba diving services increases, and that the new demand is given by $Q^D = 7,000 - 20P$. Calculate the impact of this change in demand on the values you calculated in parts (a) through (c).
 - Are consumers better off or worse off as a result of the demand increase?
 - Recalculate consumer surplus under the original scenario using calculus, and confirm that your answer is the same as in part (b) within rounding.
 - Recalculate producer surplus under the original scenario using calculus, and confirm that your answer is the same as in part (c) within rounding.
 - Calculate consumer surplus under the new demand curve using calculus, and confirm that your answer is the same as that derived as part of (d) within rounding.
 - Calculate producer surplus under the new demand curve using calculus, and confirm that your answer is the same as that derived as part of (c) within rounding.
 - Suppose that demand (in inverse form) is now $P = 500 - 0.0001Q^2$. What is consumer surplus under this new demand curve?