∂ 11. Two organic emu ranchers, Bill and Ted, serve a small metropolitan market. Bill and Ted are Cournot competitors, making a conscious decision each year regarding how many emus to breed. The price they can charge depends on how many emus they collectively raise, and demand in this market is given by $Q = 150 - P$. Bill raises emus at a constant marginal and average total cost of $10; Ted raises emus at a constant marginal and average total cost of $20.

   a. Find the Cournot equilibrium price, quantity, profits, and consumer surplus.

   b. Suppose that Bill and Ted merge, and become a monopoly provider of emus. Further, suppose that Ted adopts Bill's production techniques. Find the monopoly price, quantity, profits, and consumer surplus.

   c. Suppose that instead of merging, Bill considers buying Ted's operation for cash. How much should Bill be willing to offer Ted to purchase his emu ranch? (Assume that the combined firms are only going to operate for one period.)

   d. Has the combination of the two ranches discussed above been good for society or bad for society? Discuss how the forces of monopoly power and increased efficiency tend to push social well-being in opposite directions.

   e. Redo part (a) using calculus methods and confirm that your answers are the same as those solved algebraically.