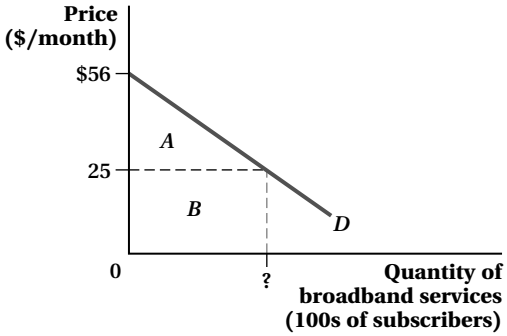
∂ 3. Consider the demand for broadband Internet service, given as follows: $Q^D = 224 - 4P$, where Q is the number of subscribers in a given area (in hundreds) and P is the price in dollars per month. This demand relationship is illustrated in the diagram on the right. Assume that the price of broadband service is $25 per month. Determine the following, paying particular attention to the units in which quantity is denominated:



a. The total number of subscribers at that price
b. The total amount paid by subscribers for broadband service, area B
c. The consumer surplus received by subscribers, area A
d. The total value to consumers of the broadband service they received, areas A and B
e. Recalculate part (d) using calculus and confirm that your answer is the same as in part (d).