

*Exercise 2.3\*\** Consider the horizontal-differentiation example in subsection 2.1.2. Consumers are uniformly distributed along a linear city of length 1, have transportation costs  $t$  per unit of distance, and have unit demands. Except for their location, they are all identical and have gross surplus  $\bar{s}$  for the good sold by the monopolist. The monopolist can sell the good at different sites, and product diversity is then measured by the number of sites. For simplicity, a law requires that the shops be at the borders of the city (at abscissa 0 and 1). The fixed set-up cost of establishing a site is  $f$ . The marginal cost of producing the good is zero. Assume that  $t/2 > f > t/4$ , and that  $\bar{s}$  is "sufficiently large" (so that the market is covered even if there is only one site). Show that the monopolist sets up two shops whereas the social planner sets up only one. Explain.