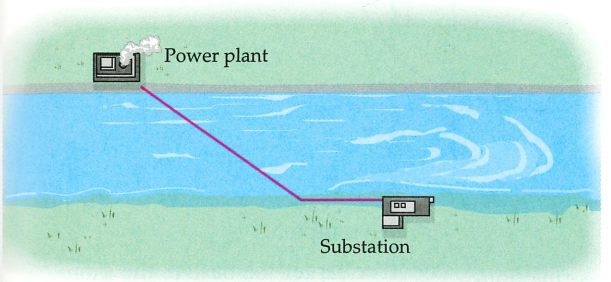
49. A power plant is located on the bank of a river that is $\frac{1}{2}$ mile wide. Wiring is to be laid across the river and then along the shore to a substation 8 miles downstream, as shown in the figure. It costs \$12,000 per mile for underwater wiring and \$8000 per mile for wiring on land. If \$72,000 is to be spent on the project, how far from the substation should the wiring come to shore?



50. A spotlight is to be placed on a building wall to illuminate a bench that is 32 feet from the base of the wall. The intensity I of the light at the bench is known to be x/d^3, where x is the height of the spotlight above the ground and d is the distance from the bench to the spotlight.

(a) Express I as a function of x. [It may help to draw a picture.]

(b) How high should the spotlight be in order to provide maximum illumination at the bench?