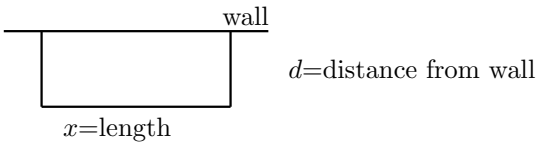
**HATT Chap 3 Practice** Name: Block: Seat:

1. Two cars are approaching an intersection. One is 1 mile south of the intersection and is moving at a constant speed of 40 mph. At the same time, the other car is 2 miles east of the intersection and is moving at a constant speed of 10 mph.

   (a) Express the distance $d$ between the cars as a function of time $t$.

   (b) For what value of $t$ is $d$ smallest?

2. A farmer wants make a rectangular garden by forming three sides of fencing against an existing wall. She has 100 feet of fencing.




(a) Express an area Function $f(x)$ that computes the area of the garden based on the length $x$, and state its domain.

(b) Express an area Function $g(x)$ that computes the area of the garden based on the distance $d$ from the wall, and state its domain.

(c) Use your calculator to graph and discover the range of possible areas of the garden

(d) What is the best distance $d$ for the most area?

3. A rectangle has one corner on the graph of $f(x) = 9 - x^2$, another at the origin, a third on the positive $y$-axis, and the fourth on the positive $x$-axis.

   (a) Express the area $A$ as a function of $x$.

   (b) For what value of $x$ is $A$ the largest?

   (c) What *is* the domain of $A$?

   (d) What *is* the range of $A$?

4. Let $P = (x, f(x))$ be a point on the graph of $f(x) = x^2 - 25$.

   (a) Express the distance $d$ from $P$ to the point $(0, 0)$ as a function of $x$.

   (b) What is $d$ if $x = 2$?