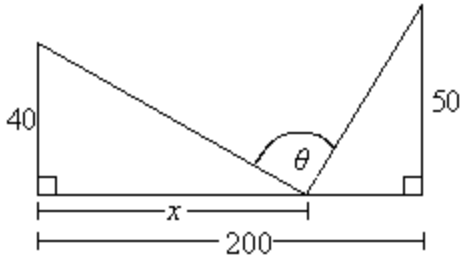
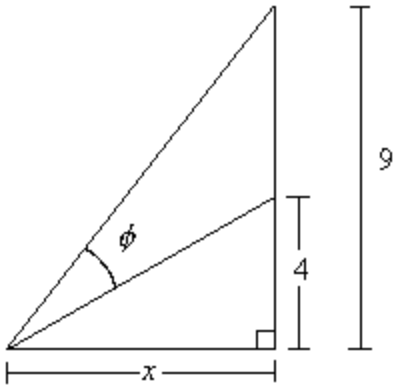
1. Two buildings are 200 feet apart and are 40 ft and 50 ft tall as shown below. A solar panel is placed between them x feet away from the shorter building.
   a) Give a possible formula for the degree measure of q as a function of x.
   Then find the value of x for which q is a maximum.



   b) If the buildings were the same height, what do you expect the value of x to be so that q is a maximum? Show this is indeed the case.

2. Write f as a function of x. Find x such that f is a maximum.



3. Using the calculus of inverse trig functions, one can determine that the value of x which makes f a maximum in the figure below is the solution to the equation $\frac{a}{x^2+a^2}=\frac{b}{x^2+b^2}$. (This arrives after some fractional algebra!) Solve this equation. Your answer involves the letters a and b. Simplify as much as possible please! Your answer should be pretty.