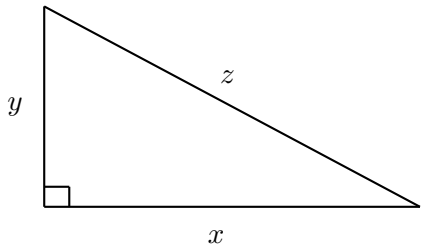
2. [9 points] Consider a right triangle with legs of length x ft and y ft and hypotenuse of length z ft, as in the following picture:



a. [2 points] Suppose that the perimeter of the triangle is 8 ft. Let $A(x)$ give the area of the triangle, in ft^2, as a function of the side length x. In the context of this problem, what is the domain of $A(x)$? *Note that you do not need to find a formula for* $A(x)$.

Answer: _____

b. [7 points] Suppose instead that the perimeter of the triangle is allowed to vary, but the area of the triangle is fixed at 3 ft^2. Let $P(x)$ give the perimeter of the triangle, in ft, as a function of the side length x.

(i) In the context of this problem, what is the domain of $P(x)$?

Answer: _____

(ii) Find a formula for $P(x)$. The variables y and z should not appear in your answer. (This is the equation one would use to find the value(s) of x minimizing the perimeter. You should not do the optimization in this case.)

Answer: $P(x) =$ _____