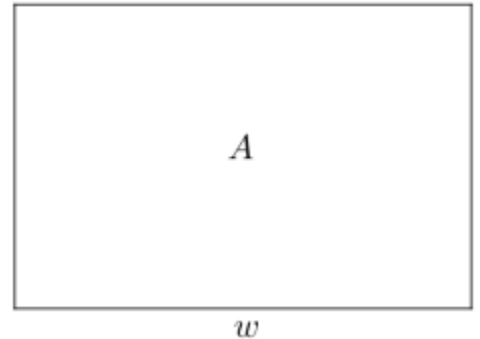


Radical Goats

Juan wants to buy goats for his yard. He will build a pen to keep them safe. Each goat needs a certain amount of grazing area, so Juan will have to do some careful planning. Based on his research, he thinks that his pen should have a height that is two-thirds of the width. Let w be the width of his pen and A be the area of the pen.



1. Write a function of A in terms of the width w .
2. Rewrite the function from (1) to be a function of A in terms of w .
3. Graph the function from (2).
4. Juan wants to buy 15 goats. EACH goat needs a grazing area of 30-50 square feet.
 - a. Based on these constraints, what is a reasonable domain restriction for the function from (2)?
 - b. What is the smallest width Juan's pen could have?
 - c. What is the largest width Juan's pen could have?



5. Based on the cost of materials and feed, Juan decides his pen will have an area of 700 square feet. He will then hire a company to install the fence.
 - a. Create a sketch of the pen to give to the builders. Make sure to label all dimensions.
 - b. If the company charges \$25 per foot of fence installed, how much will Juan's pen cost?

Reflection: Is there a limit to how much area a goat should have? Discuss natural limits to this, thinking mathematically and reasonably. Why or why not?