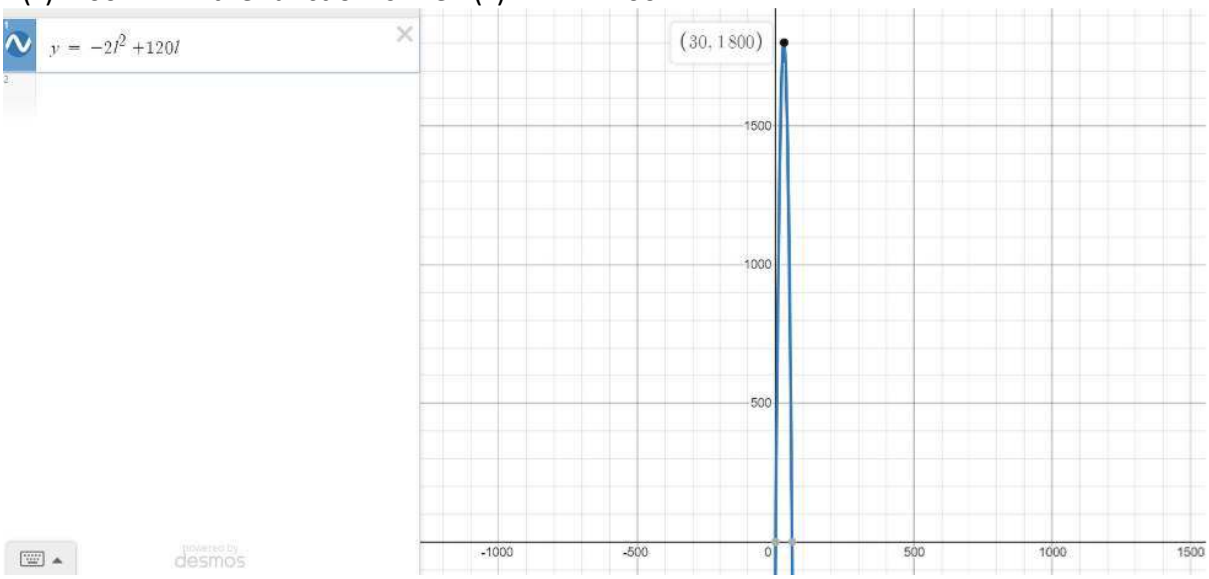
DF Unit 3 MATH1201 - Discussion Forum unit .

College Algebra (University of the People)

Polynomial and rational functions can be used to simulate a wide range of scientific, technological, and everyday occurrences. Let's have a look at how polynomials are utilized in the modeling of various building designs, as well as many other aspects of human life.
A constructor wishes to enclose a portion of ground for a new play yard. He'll utilize a part of the backyard fence as the fourth side, and he'll buy 200 feet of fencing to enclose three sides.
To find a formula for the area encompassed by the fence if the sides of the fence perpendicular to the current fence are L in length and W in width.
We know we only have 200 feet of fence to work with, and L + W + L = 200,
or 2L + W = 200. This enables us to express the width, W, in terms of the length, L.

W=200-2L
We may now develop an equation for the area enclosed by the barrier. We know that the area of a rectangle is equal to the length times the width, therefore
 X=L*W
A(L)=200L-2L^2 the function is like f(x)=-2x^2+200x



On the graph we see that it opens downward, negative leading coefficient proves it. The maximum value for the area is the vertex points.
To find the vertex:
 h=-b/2a. h=-200/2(-2). h=50
k=A(50) k=5000
When L = 50 feet, the maximum value of the function is an area of 5000 square feet. When the shorter sides are 50 feet, the longer side has 100 feet of fencing left. She should enclose the garden so that the two shorter sides are 50 feet long and the longest side parallel to the current fence is 100 feet long to optimize the space.