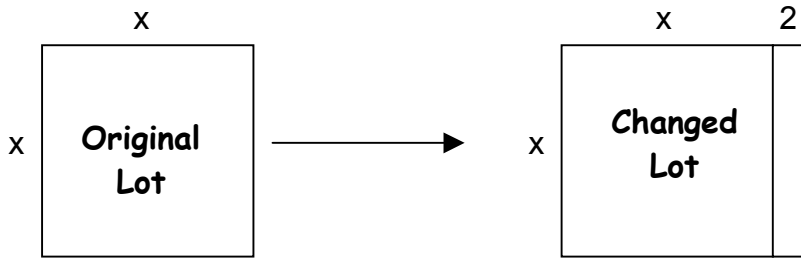


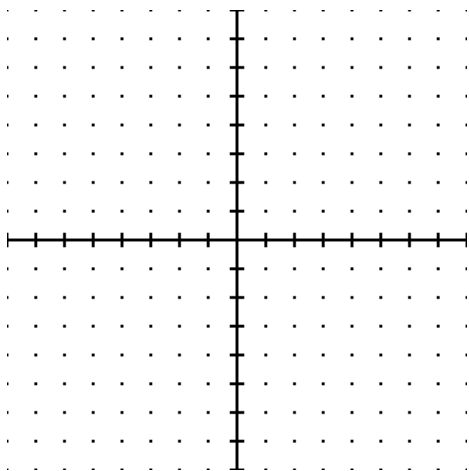
Changing Lots

Part I. Investigating Changes

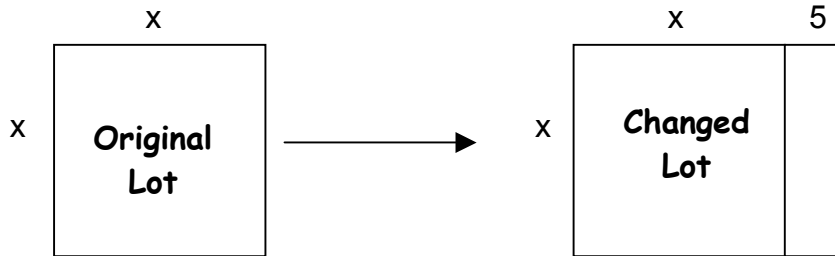
From our previous studies, we know we can determine the area of a given rectangle or square by multiplying the length and width. We have also determined that the lot with the maximum area would be a square. Let's investigate what happens to the area if we are allowed to buy or sell additional pieces of land that are adjacent to the land we already own.



1. What are the dimensions of the **original** lot?
2. Write an equation to find the area of the **original** lot.
3. What are the dimensions of the **changed** lot?
4. Write an equation to find the area of the **changed** lot.
5. How much greater is the area of the **changed** lot compared to the **original** lot?
6. Graph your equations from #2 and #3 on your calculator. Describe the difference in the two graphs. Be sure to include notions such as parameter changes, vertex, minimum/maximum, roots, etc.



Part II. Compare the following two lots:



7. How much greater is the area of the **changed** lot compared to the area of the **original** lot?

8. Write an equation for the area of the **changed** lot.

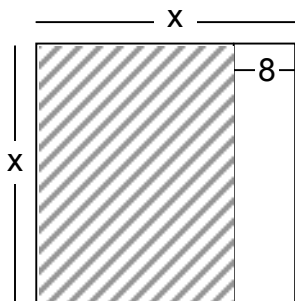
9. Write an equation for the area of the **changed** lot using the area of the **original** lot plus the area of the added part.

10. Graph your equations from #2 and #3 on your calculator. Describe the difference in the two graphs. Be sure to include notions such as parameter changes, vertex, minimum/maximum, roots, etc.

A coordinate plane grid is shown on the left, with x and y axes. To the right of the grid are six horizontal lines for graphing.

The expression $(n-2)(n+2)$ is said to be in **factored form** because it is written as the product of two linear factors. An expression that is written as the sum or difference of terms is said to be in *term form*, or **expanded form**. A **term** is a group of variables and/or numbers multiplied together. In #8 above, you wrote an equation for the area in factored form and in #9 you wrote an equation for the area in term or expanded form.

11. The lot below is divided into two rectangles. Write two expressions for the area of the shaded part, one in factored form and the other in expanded form.



12. Graph the two equations from #12 (the equation in expanded form, and the equation in factored form in your calculator. What are the root(s) of the equations?
13. Represent the area of $x(2x + 6)$ in expanded form, and graph both equations. Use your calculator to identify the root(s).
14. Based on your experience from # 12 and #13, what is the relationship between the coordinates of a root and the expression in factored form? Explain your findings.
