

For any constant c , define the function f_c with the formula $f_c(x) = x^3 + 2x^2 + cx$.

1. Graph $y = f_c(x)$ for these values of the parameter c : $c = -1, 0, 1, 2, 3, 4$. What are the similarities and differences among the graphs, and how do the graphs change as the parameter increases?
2. For what values of the parameter c will f_c have one local maximum and one local minimum? Use calculus. As c increases, what happens to the distance between the local maximum and the local minimum?
3. For what values of the parameter c will f_c have no local maximum or local minimum? Use calculus.
4. Are there any values of the parameter c for which f_c will have exactly one horizontal tangent line?