Worksheet 11 Numerical Analysis Spring 2023

Name: _____ NetID: | | | | | | | | | | |

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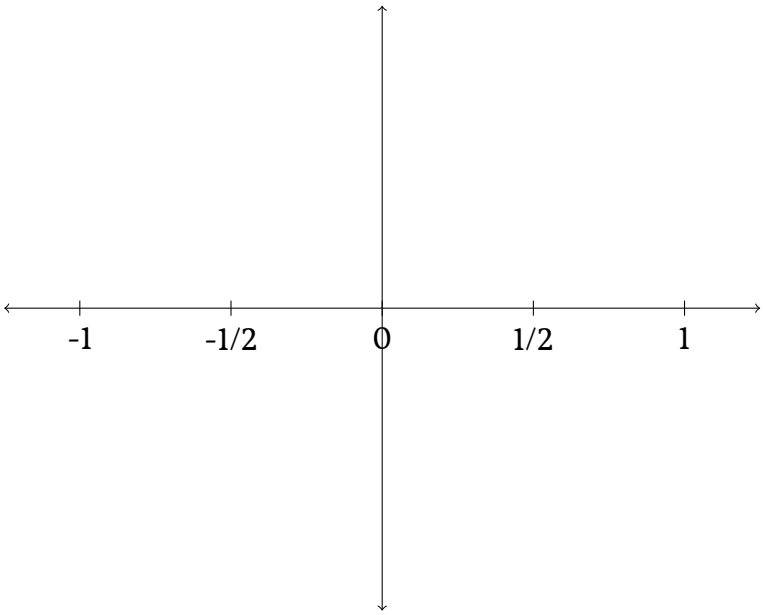
Work in groups of at least 2 and at most 4.

1. Write the general form of a polynomial which has zeros at $-1, -1/2, 0, 1$ but no other points.

2. Find the polynomial which has zeros at $-1, -1/2, 0, 1$ and is equal to one at $1/2$.

3. Find the polynomial which has zeros at $-1/2, 0, 1$ and is equal to one at -1.

4. Plot each the previous two polynomials, their sum, and twice the polynomial from 2 minus the polynomial from 3.



5. Fix distinct values $x_1, x_2, \ldots, x_k$. Let j be some integer between 1 and k. Write the formula for the polynomial which is one at x_j and zero at the rest of the x_i.

6. For each j, call the polynomial in the previous problem $\ell_j(x)$. Write down the formula for the degree k–1 polynomial which passes through $(x_1, y_1), (x_2, y_2), \ldots, (x_k, y_k)$.