Complete as many of the following problems as you can with your group. You do not have to go in order. Each person will be given two specific problems that they must complete and present to either Professor MG or to Stefanie before they leave.

(1) Divide $\frac{x^3+1}{x-1}$,

(2) Divide $\frac{x^6+64}{x-2}$

(3) Divide $\frac{x^2-8x+4}{x-3}$

(4) Divide $\frac{x^2-6x-2}{x+5}$

(5) Divide $\frac{27x^3+9x^2-3x-9}{3x-2}$

(6) Divide $\frac{x^6-64}{x-2}$

(7) Divide $(12x^2 + 7x - 4) \div (4x - 3)$

(8) Divide $(9x^3 - 3x^2 - 5x - 25) \div (3x - 5)$

(9) Divide $\frac{4x^3+17x^2+12x-2}{x+4}$

(10) Divide $(2x^4 + 5x^3 + 7x^2 + 16x + 15) \div (2x + 3)$

(11) Divide $(3x^3 + x^2 + 2x + 5) \div (x^2 + 2x + 1)$

(12) Divide $(3x^4 + x^3 - 17x^2 + 19x - 6) \div (x^2 - 2x + 1)$

Optional Challenge: Apply what you know to $(2x^3 + 12x^2y + 15xy - 9y^3) \div (x + 3y)$

Key:

(1) $x^2 + x + 1 + \frac{2}{x-1}$

(2) $x^5 + 2x^4 + 4x^3 + 8x^2 + 16x + 32 + \frac{128}{x-2}$

(3) $x - 5 + \frac{-11}{x-3}$

(4) $x - 11 + \frac{53}{x+5}$

(5) $9x^2 + 9x + 5 + \frac{1}{3x-2}$

(6) $x^5 + 2x^4 + 4x^3 + 8x^2 + 16x + 32$

(7) $3x + 4 + \frac{8}{4x-3}$

(8) $3x^2 + 4x + 5$

(9) $4x^2 + x + 8 + \frac{-34}{x+4}$

(10) $x^3 + x^2 + 2x + 5$

(11) $3x - 5 + \frac{9x+10}{x^2+2x+1}$

(12) $3x^2 + 7x - 6$

Challenge: $2x^2 + 6xy - 3y^2$