1. Divide using long division.

$x^3-4x^2+2x-9\div x^2+2$

Answer: $x = \pm 2$

2. Write a polynomial in **factored form** with zeros at 1, -3, and $\frac{3}{4}$.

Answer: $x-4+\frac{-1}{x^2+2}$

3. Factor Completely.

$2x^3-3x^2-8x+12$

Answer: $(x-1)(x+3)(4x-3)$

4. Rewrite in standard form then name by degree and number of terms.

$(x-4)(x^2+5x+2)$

Answer: $(x+2)(x-2)(2x-3)$

5. Factor Completely.

$81x^3-24$

Answer: x^3-x^2+4x-4, cubic polynomial

6. Describe the end behavior of the function: $f(x) = -x(x-3)^3(2x+1)$

Answer: $3(3x-2)(9x^2+6x+4)$

7. Solve for ALL zeros:

$$(5x^3 - x - 3) - (2x^3 - x^2 - 4) = 0$$

Answer: fall/rise

8. State the zeros and multiplicity of each root of the polynomial:

$f(x)=-x(x-2)(x+3)^3$

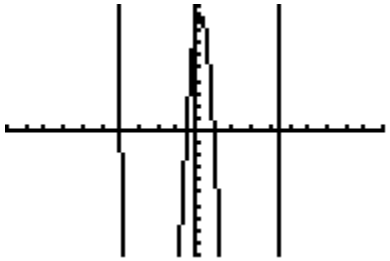
Answer: $x = -1, \frac{1 \pm i\sqrt{2}}{3}$

9. Factor Completely.

$2x^3+10x^2+12x$

Answer: $x = 0, m = 1 | x = 2, m = 1 | x = -2, m = 3$

10. **List all zeros:** $f(x)=x^4-x^3-18x^2+10x+8$



X	Y1
-5	258
-4	0
-3	-76
-2	-60
-1	-18
0	8
1	0

X=1

Answer: $2x(x+3)(x+2)$

11. Solve for all zeros:

$$f(x)=x^4-x^2-12$$

Answer: $x = -4, 1, 2 \pm \sqrt{6}$