PC 3 Unit Graphing Polynomials Worksheet

Directions: Graph the following polynomials. Identify the end behavior.

1. \( p(x) = (x - 4)^2 \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)

2. \( p(x) = (x + 5)^2 \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)

3. \( p(x) = x(x - 2)(x + 1) \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)

4. \( p(x) = (x + 6)^2(x - 3) \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)

5. \( p(x) = (x - 1)^2(x + 4)^2(x - 2) \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)

6. \( p(x) = (x + 3)^2(x - 2)^2(x + 5) \)

As \( x \to \infty, f(x) \to ____ \infty \) and
   as \( x \to \infty, f(x) \to ____ \infty \)
Directions: Factor the polynomial into linear terms, graph the polynomial, and identify its end behavior.

7. \( p(x) = (x - 2)^2(x - 3)(x + 1)^3 \)

8. \( p(x) = (x + 5)(x + 2)^2(x - 3)^2 \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)

9. \( p(x) = x^4 - 2x^3 - 3x^2 \)

10. \( p(x) = -x^3 + x^2 + 6x \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)

11. \( p(x) = x^4 - 2x^3 - 3x^2 + 8x - 4 \)

12. \( p(x) = x^4 - 4x^2 + 3 \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)

As \( x \to \infty, f(x) \to \_\_\infty \) and
as \( x \to -\infty, f(x) \to \_\_\infty \)