

Polynomial Functions Review Worksheet

Problems 1 through 6 refer to the following functions:

$$f(x) = 3x^4 - 2x^2 + x - 4, \quad g(x) = 2x^5 - 4x^3, \quad h(x) = -3x^4 - 2, \quad p(x) = x^3 + 6x^2 + 11x + 6$$

1. Determine the maximum number of relative extrema for each polynomial.
2. Determine the number of possible positive and negative zeros for each polynomial.
3. Determine whether each polynomial is even, odd, or neither.
4. List the possible rational zeros for each polynomial.
5. Find the zeros of $p(x)$.
6. Graph $p(x)$.
7. Graph $m(x) = \frac{4x^2 + 7x}{x + 3}$ and determine its asymptotes.
8. Graph $n(x) = \frac{x^2 - 2x - 3}{x^2 - 5x - 6}$ and determine its asymptotes.
9. Solve $\sqrt{x+4} + \sqrt{5x} = 8$.
10. Solve $\sqrt[3]{2x-5} + 6 = 11$.
11. Solve $\sqrt[3]{x^2 - x + 8} + 1 = 2\sqrt{x}$ to the nearest hundredth.
12. Decompose $\frac{8}{x^3 - 6x^2 + 8x}$ into partial fractions.
13. Decompose $\frac{-2x^2 + 14x - 15}{(x-1)(x-2)^2}$ into partial fractions.