

Lesson #12: Understanding and Solving Polynomial Equations and Finding the Roots of Polynomials
(Reference: Lesson #66, #76 & #85 in book)**Problem**

1. Solve each of the following polynomial equations by finding the roots of the polynomial. Express all of the real roots in your final answer.

1. $2x^4 - 10x^3 - 72x^2 = 0$

2. $x^4 - 14x^3 + 49x^2 = 0$

3. $4x^3 + x = 4x^2$

4. $x^4 = 2x^2 - 1$

5. $x^4 - 14x^2 + 45 = 0$

6. $x^3 - x - 3 = -3x^2$

7. $x^3 - 2x^2 - 5x + 6 = 0$

8. $3x^3 + x^2 - 8x + 4 = 0$

9. $x^4 - 10x^3 - 12x^2 + 360x = 864$

10. $4x^4 + 13x^3 - 49x^2 - 73x - 15 = 0$

11. $x^3 - x^2 - 13x - 3 = 0$

12. $x^3 - 20 = 14x - 3x^2$

13. Determine the zeros or root of each of the following polynomial functions. Express all of the real roots in your final answer and rewrite your function as a fully factored function.

13. $f(x) = 4x^3 - 26x^2 + 30x$

14. $f(x) = 6x^3 + 10x^2 + 4x$

15. $f(x) = x^4 - 3x^3 + 2x^2 - 6x$

16. $f(x) = 2x^4 - 14x^3 + 26x^2 - 30x$