

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

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

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

2. $f(x) = 6x^3 + 21x^2 + 18x$

3. $f(x) = 2x^5 - 6x^4 - 56x^3$

4. $f(x) = 3x^3 + 3x^2 - 9x$

5. $f(x) = 4x^4 - 64x^2$

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

7. $f(x) = x^4 - 2x^3 - 27x + 54$

8. $f(x) = 2x^4 - 9x^3 + 2x^2 + 9x - 4$

9. $f(x) = 2x^4 - 7x^3 + x^2 + 7x - 3$

10. $f(x) = (x - 2)(x^2 + 2) - (x - 2)(4x + 7)$

11. $f(x) = (x + 4)(x^2 - 9) - (x + 4)(4x + 1)$

12. $f(x) = (x - 7)(x^4 - 8x) - (x - 7)(-8x + 1)$

13. $f(x) = (x^2 - 4)(6x^4 - 13) + (x^2 - 4)(-5x^4 + 4)$

14. $f(x) = (x + 2)(5x^2 + 3x) - (x + 2)(4x^2 + 3)$

15. $f(x) = 2x^4 - 14x^3 - 8x^2 + 56x$

16. $f(x) = 5x^4 - 9x^3 + 8x^2 + 2x$

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17. $f(x) = 2x^4 - 8x^3 + x^2 + 11x$

18. $f(x) = x^3 - 125$

19. $f(x) = x^3 + 216$

20. $f(x) = x^6 - 729$