

I. Use the Rational Root Theorem to identify all the POSSIBLE rational roots.

1. $f(x) = x^5 - 3x^4 - 5x + 12$

2. $f(x) = 3x^4 + 5x^2 - 7x + 9$

II. Use the Irrational Root Theorem to find the smallest possible degree of the polynomial with the given roots.

3. $6, \sqrt{3}, -\sqrt{5}$

4. $-4, 1 - \sqrt{5}$

III. Identify all the real roots of each equation. GIVE EXACT VALUES. No decimals.

5. $6x^3 + 67x^2 - 153x - 130 = 0$

6. $16x^4 - 30x^3 - 175x^2 + 165x - 36 = 0$

7. $x^4 - x^3 = 18x^2 - 12x - 72$

IV. Graphing Calculator.

8. Consider the polynomial function $f(x) = x^4 + 3x^3 - 3x^2 - 12x - 4$.

(a) Use the Rational Root Theorem to list the possible rational roots of this equation.

(b) Graph the polynomial on a graphing calculator. Which possible rational roots are zeros of $f(x)$? How do you know?

(c) According to the graph, how many other real zeros does the function have?

(d) Approximate these zeros to the nearest hundredth by using the zero feature.