

I. Divide the polynomials using polynomial long division.

1. $(5x^3 - 13x^2 - x + 2) \div (x^2 - 3x + 1)$

2. $(x^4 - 3x^2 + 2) \div (x^2 - 1)$

II. Divide the polynomials using synthetic division.

1. $(2x^3 + 2x^2 - x + 2) \div \left(x - \frac{1}{2}\right)$

2. $(3x^3 - 10x^2 + 12x - 22) \div (x - 4)$

III. Use synthetic division to evaluate each function.

1. Given $f(x) = 4x^3 - 13x + 10$. Find $f(8)$.

IV. Use synthetic division to show that the given binomial is a factor.

1. $g(x) = x^4 - 11x^3 + 41x^2 - 61x + 30$ factor $(x - 5)$

V. Use the Rational Zero Test to determine the set of possible rational zeros.

1. $f(x) = 2x^4 - 17x^3 + 35x^2 + 9x - 45$

VI. Write a polynomial function, given the zeros of the function.

1. $x = [3, -3, 4]$

2. $x = [6, -1, 2, 3]$

VII. Given one zero of the polynomial function, find the other zeros.

1. $f(x) = x^3 + x^2 - 13x + 3$; $x = 3$

2. $g(x) = x^4 + 6x^3 - 4x^2 - 54x - 45$; $x = -3$ and $x = 3$

VIII. Find the real zeros of the polynomial function.

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

2. $g(x) = x^3 - 13x^2 + 23x - 11$

3. $h(x) = x^3 + 4x^2 + 5x + 2$

6. $h(x) = 5x^3 + 29x^2 + 19x - 5$

4. $h(x) = 4x^3 - 9x^2 + 6x - 1$

7. $h(x) = 3x^3 + 11x^2 + 5x - 3$

5. $h(x) = 5x^4 - 46x^3 + 84x^2 - 50x + 7$

8. $h(x) = 3x^4 - 10x^3 - 24x^2 - 6x + 5$