

Factoring Techniques and Function Analysis with Sign Charts

Basic Factoring Rules

Factor the following polynomials completely.

1. $9x^3y - 25xy^3$

2. $6a^2b^2 + 29ab + 28$

3. $32c^3 - 108d^3$

4. $2x^5 + 16x^2y^3$

5. $8y^3 + 24y^2 - 7y - 21$

6. $x^2 + 12x + 36 - 25y^2$

Negative and Fractional Exponents

Factor and express the answer as a quotient with positive exponents.

7. $x^{-2} - 4x^{-5} + 3x^{-8}$

8. $x^{\frac{5}{4}}y^{\frac{-1}{3}} + x^{\frac{-3}{4}}y^{\frac{2}{3}}$

9. $\frac{1}{2}x^{\frac{-1}{4}} + 3x^{\frac{3}{4}} + \frac{1}{2}x$

10. $5(2x-1)^{\frac{-1}{2}} + x(2x-1)^{\frac{1}{2}}$

11. $\frac{8}{3}(x+1)^3(7x-3)^{\frac{1}{3}} + 3(7x-3)^{\frac{4}{3}}(x+1)^2$

Function Analysis

Determine the domain and zeros of the function, and use sign charts to determine intervals where the function is positive and negative.

12. $P(x) = (x+5)(x-8)$

13. $P(x) = \frac{-6}{2x-3}$

14. $P(x) = \frac{x+1}{x+2}$

15. $P(x) = \frac{x}{(x+7)(x-2)}$

16. $P(x) = \frac{6x^2 - 7x - 3}{2}$

17. $P(x) = \frac{x-5}{(x+2)(x-5)}$

18. $P(x) = \frac{x}{x^2+1}$

19. $P(x) = \frac{x^2 - 5x - 6}{x^2 + 5x - 6}$

20. $P(x) = \frac{(x-3)(x+2)^2}{(x-10)^3}$