

Honors Math 3
Finding Roots of Polynomials

List all possible rational roots.

1. $x^3 - x^2 + 3x - 3 = 0$

3. $x^4 + x^3 - 10x^2 - 4x + 24 = 0$

5. $5x^3 - 9x^2 - 17x - 3 = 0$

7. $3x^4 - 25x^3 + 11x^2 - 25x + 8 = 0$

2. $x^3 - 10x^2 + 17x - 8 = 0$

4. $2x^3 - 7x^2 + 7x - 2 = 0$

6. $3x^4 + 11x^3 - x^2 + 11x - 4 = 0$

8. $3x^4 + 29x^3 - 7x^2 + 29x - 10 = 0$

State the number of positive and negative real roots.

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

11. $g(x) = 4x^3 + 5x^2 + 2x - 6$

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

15. $h(x) = 3x^3 + 2$

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

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

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

16. $g(x) = x^3 - 2x^2 - 3x$

Find the number of possible real and imaginary roots.

17. $g(x) = 2x^3 + 3x^2 - 8x + 3$

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

18. $g(x) = 6x^3 - 11x^2 - 24x + 9$

20. $f(x) = 5x^3 + 6x^2 - x - 1$

Find all roots.

21. $x^3 - 4x^2 - 3x + 18 = 0$

23. $x^3 - 5x^2 + 4x - 20 = 0$

25. $x^3 + x^2 - 2x - 2 = 0$

27. $x^3 - 4x^2 - 7x + 10 = 0$

29. $x^3 - 19x - 30 = 0$

31. $3x^3 - 5x^2 + 14x - 8 = 0$

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

35. $x^3 + 6x^2 + 12x + 8 = 0$

37. $x^3 + 5x^2 + 3x - 34 = 0$

39. $x^4 + 4x^3 - 2x^2 - 12x + 9 = 0$

41. $x^4 - 4x^3 + 6x^2 - 4x + 1 = 0$

43. $x^4 + 13x^2 + 36 = 0$

45. $4x^4 + 12x^3 + 19x^2 - 3x - 5 = 0$

22. $x^3 - x^2 - 8x + 12 = 0$

24. $x^3 + 9x^2 + 23x + 15 = 0$

26. $x^3 - x^2 - 14x + 24 = 0$

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

30. $2x^3 + 5x^2 + 6x + 2 = 0$

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

34. $x^3 - 5x^2 - x + 5 = 0$

36. $x^3 - 3x^2 + x - 3 = 0$

38. $x^3 - 8x + 32 = 0$

40. $x^4 + 8x^3 + 24x^2 + 32x + 16 = 0$

42. $x^4 - x^3 - 11x^2 - 5x + 4 = 0$

44. $x^4 + x^2 - 20 = 0$

46. $2x^3 + 5x^2 + 6x + 2 = 0$