

Use the Rational Zero Theorem to answer: {Odds}

List all possible rational zeros of each function. Then determine which, if any, are zeros. (Examples 1 and 2)

1–8. See margin

1. $g(x) = x^4 - 6x^3 - 31x^2 + 216x - 180$
2. $f(x) = 4x^3 - 24x^2 - x + 6$
3. $g(x) = x^4 - x^3 - 31x^2 + x + 30$
4. $g(x) = -4x^4 + 35x^3 - 87x^2 + 56x + 20$
5. $h(x) = 6x^4 + 13x^3 - 67x^2 - 156x - 60$
6. $f(x) = 18x^4 + 12x^3 + 56x^2 + 48x - 64$
7. $h(x) = x^5 - 11x^4 + 49x^3 - 147x^2 + 360x - 432$
8. $g(x) = 8x^5 + 18x^4 - 5x^3 - 72x^2 - 162x + 45$

Use Descartes's Rule of Signs to answer: {Odds}

Describe the possible real zeros of each function. (E)

26–31. See r

26. $f(x) = -2x^3 - 3x^2 + 4x + 7$
27. $f(x) = 10x^4 - 3x^3 + 8x^2 - 4x - 8$
28. $f(x) = -3x^4 - 5x^3 + 4x^2 + 2x - 6$
29. $f(x) = 12x^4 + 6x^3 + 3x^2 - 2x + 12$
30. $g(x) = 4x^5 + 3x^4 + 9x^3 - 8x^2 + 16x - 24$
31. $h(x) = -4x^5 + x^4 - 8x^3 - 24x^2 + 64x - 124$

{Odds}

Write a polynomial function of least degree with real coefficients in standard form that has the given zeros.

(Example 6) **32–41. See margin.**

32. 3, -4, 6, -1
33. -2, -4, -3, 5
34. -5, 3, 4 + i
35. -1, 8, 6 - i
36. $2\sqrt{5}$, $-2\sqrt{5}$, -3, 7
37. -5, 2, $4 - \sqrt{3}$, $4 + \sqrt{3}$
38. $\sqrt{7}$, $-\sqrt{7}$, $4i$
39. $\sqrt{6}$, $-\sqrt{6}$, $3 - 4i$
40. $2 + \sqrt{3}$, $2 - \sqrt{3}$, $4 + 5i$
41. $6 - \sqrt{5}$, $6 + \sqrt{5}$, $8 - 3i$