

Polynomials and Conjugate Roots

A polynomial function with rational coefficients has the follow zeros. Find all additional zeros.

1) $-1, 1 + 3i$

2) $-\frac{1}{4}, 1 + \sqrt{6}$

3) -3 mult. 2, $2\sqrt{2}$

4) $1 + \sqrt{3}, -3 + \sqrt{5}$

5) $1 - i, \sqrt{7}$

6) $-3 + 2i, -2 - 2i, -2 + 2i$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

7) $-\frac{1}{2}, 1, \frac{3}{4}$

8) $-1, -i$

9) 2 mult. 3

10) $-3, 2\sqrt{2}$

11) $-3, \sqrt{3}$

12) $1 + \sqrt{10}$ mult. 2, $1 - \sqrt{10}$

13) $-i$ mult. 2

14) $\frac{4}{5}, 2i$

Critical thinking questions:

15) Explain why it makes sense that a third-degree polynomial must have at least one rational zero.

16) Write a polynomial function of degree ten that has two imaginary roots.