Name Key Class _____ Date _____

Practice 6-5(2) Theorems About Roots of Polynomial Equations

A polynomial equation with rational coefficients has the given roots. Find two additional roots.

1. $2 + 3i$ and $\sqrt{7}$

$2-3i,\ -\sqrt{7}$

2. $3 - \sqrt{2}$ and $1 + \sqrt{3}$

$3+\sqrt{2},\ 1-\sqrt{3}$

3. $-4i$ and $6 - i$

$4i,\ 6+i$

4. $5 - \sqrt{6}$ and $-2 + \sqrt{10}$

$5+\sqrt{6}\quad -2-\sqrt{10}$

Find a fourth-degree polynomial equation with integer coefficients that has the given numbers as roots.

5. $2i$ and $4 - i$

$x^4-8x^3+21x^2-32x+68=0$

6. $\sqrt{2}$ and $2 - \sqrt{3}$

$x^4-4x^3-x^2+8x-2=0$

7. $3i$ and $\sqrt{6}$

$x^4+3x^2-54=0$

8. $2 + i$ and $1 - \sqrt{5}$

$x^4-6x^3+9x^2+6x-20=0$

Find the roots of each polynomial equation.

21. $x^3 - 2x^2 - 5x + 6 = 0$

$-2,\ 1,\ 3$

22. $x^3 - 8x^2 - 200 = 0$

$10,\ -1 \pm i\sqrt{19}$

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

$1,\ -3$

24. $4x^3 - 12x^2 - x + 3 = 0$

$3,\ \pm\frac{1}{2}$

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

$2,\ \frac{-3\pm\sqrt{13}}{2}$

26. $12x^3 + 31x^2 - 17x - 6 = 0$

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

Find a third-degree polynomial equation with rational coefficients that has the given numbers as roots.

33. $3,\ 2 - i$

$x^3-7x^2+17x-15=0$

34. $5,\ 2i$

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

35. $-1,\ 3 + i$

$x^3-5x^2+4x+10=0$

36. $-7,\ i$

$x^3+7x^2+x+7=0$

37. $-4,\ 4i$

$x^3+4x^2+16x+64=0$

38. $6,\ 3 - 2i$

$x^3-12x^2+49x-78=0$