SECTION 6-4

EXERCISE A

Solve the following equations. Consider factoring whenever possible.

1) $x^2 + 4 = 0$ 2) $x^3 + 4x^2 - 21x = 0$ 3) $x^3 + 2x^2 - 9x - 18 = 0$

Given a zero of a polynomial, name the complex conjugate that must also be a zero for the polynomial.

4) $11 - 4i$ 5) $7 + 2i$ 6) $-1 - 6i$ 7) $-63i$

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

8) 6, -5 9) 3, -3, 4 10) -1, 2, 3 11) 5, $2i$

EXERCISE B

Solve the following equations. Consider factoring whenever possible.

12) $x^3 + 9x = 0$ 13) $x^4 - 81 = 0$ 14) $x^3 + x - 4 = 4x^2$ 15) $4x^4 - 15x^2 = 4$

Given a zero of a polynomial, name the complex conjugate that must also be a zero for the polynomial.

16) $7 + 3i$ 17) $-1 - 14i$ 18) $22 - i$ 19) $8i$

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

20) -4, 1, 5 21) -2, 2, 4, 6 22) $4i$, 3, -3 23) $2i$, $3i$, 1

EXERCISE C

24) Write a polynomial function of least degree with zeros: 9, $1 + 2i$

25) Antonio is preparing to make an ice sculpture. Before he begins, he wants to reduce a 3ft. by 4ft. by 5ft. block of ice by shaving off the same amount from the length, width and height. He wants the reduced volume to be 24 cubic feet.

a) Write a polynomial equation to model it.

b) How much should he take from each dimension?

ANSWERS:

1) $x = \pm 2i$

3) $x = -2, \pm 3$

5) $7 - 2i$

7) $63i$

9) $f(x) = x^3 - 4x^2 - 9x + 36$

11) $f(x) = x^3 - 5x^2 + 4x - 20$

13) $x = \pm 3, \pm 3i$

15) $x = \pm 2, \pm 1/2i$

17) $-1 + 14i$

19) $-8i$

21) $f(x) = x^4 - 10x^3 + 20x^2 + 40x - 96$

23) $f(x) = x^5 - x^4 + 13x^3 - 13x^2 + 36x - 36$

25a) $(3 - x)(4 - x)(5 - x) = 24$

b) 1 foot