Sec 3.4
Writing polynomials given the zeros

Write a polynomial given the zeros are -2,2 and i and that f(3) = -150

$(x+2)(x-2)(x+i)(x-i)$

$(x^2-4)(x^2-i^2)$

$(x^2-4)(x^2+1)$

x^4-3x^2-4

$i=\sqrt{-1}\quad i^2=-1$

$-150=c(3^4-3(3)^2-4)$

$-150=c(50)$

$-3=c$

$-3x^4+9x^2+12$

Write a polynomial that has zeros 3,4, and 2i and f(-1) = -50

$-2i$

$(x-3)(x-4)(x+2i)(x-2i)$

$(x^2-7x+12)(x^2+4)$ $-\frac{1}{2}x^4+\frac{7}{2}x^3-8x^2+14x-24$

$x^4-7x^3+12x^2+4x^2-28x+48$

$x^4-7x^3+16x^2-28x+48$

$-50=c[(-1)^4-7(-1)^3+16(-1)^2-28(-1)+48]$

$-50=c[1+7+16+28+48]=100$

$c=-1/2$

Write a polynomial that has zeros -4, 1/3, 2 +3i and f(1) = 100

$2+3i$

$(x+4)(3x-1)([x-2]+3i)([x-2]-3i)$

$(3x^2+11x-4)((x-2)^2-9i^2)$

$(3x^2+11x-4)(x^2-4x+13)$

$3x^4-12x^3+39x^2+11x^3-44x^2+143x-4x^2+16x-52$

$3x^4-x^3-9x^2+159x-52$ final

$100=c(3-1-9+159-52) \rightarrow c=1$

$100=c(100)$

Suggested Practice
Sec 3.4
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25,27,29,31

25. $2x^3-2x^2+50x-50$

27. $x^3-3x^2-15x+125$

29. x^4+10x^2+9

31. $x^4-9x^3+21x^2+21x-130$