**Find a polynomial f(x) of degree 3 that has the indicated zeros and satisfies the given condition.**

1. -1, 2, 3; f(-2) = 80 2. -4, 3, 0; f(2) = -36 3. -2i, 2i, 3; f(1) = 20

4. Find a polynomial f(x) of degree 4 with leading coefficient 1 such that both -5 and 2 are zeros of multiplicity 2, and sketch the graph of f.



5. Find a polynomial f(x) of degree 6 such that 0 and 3 are both zeros of multiplicity 3 and f(2) = -24. Sketch the graph of f.



6. Find the third-degree polynomial function in factored form with y-intercept (0, 3.5) and x-intercepts (1.5, 0), (-1, 0), & (3, 0).

**Find the zeros of f(x), and state the multiplicity of each zero.**

7. f(x) = x2(3x+2)(2x-5)3  8. f(x) = 4x5 + 12x4 + 9x3

9. f(x) = (x2 + x - 12)3(x2 - 9)2  10. f(x) = x4 + 7x2 - 144

**Show that the number is a zero of f(x) of the given multiplicity, and express f(x) as a product of linear factors.**

11. f(x) = x4 + 7x3 + 13x2 - 3x - 18; 12. f(x) = x6 - 4x5 + 5x4 - 5x2 + 4x - 1; -3(multiplicity 2) 1(multiplicity 5)

**Graph to determine the number of positive, negative, and nonreal complex solutions of the equation.**

13. 4x3 - 6x2 + x - 3 = 0 14. 4x3 + 2x2 + 1 = 0 15. 3x4 + 2x3 - 4x + 2 = 0

  

**The polynomial function f has only real zeros. Use the graph of f to factor it.**

16. f(x) = x5 - 16.75x3 + 12.75x2 + 49.5x - 54



**Graph f, estimate all real zeros, and determine the multiplicity of each zero.**

17. f(x) = x3 + 1.3x2 - 1.2x - 1.584

