**Find the quotient and remainder if f(x) is divided by p(x).**

1. f(x) = 2x4 - x3 - 3x2 + 7x - 12; p(x) = x2 - 3 2. f(x) = 3x4 + 2x3 - x2 - x - 6; p(x) = x2 + 1

3. f(x) = 3x3  + 2x - 4; p(x) = 2x2 + 1 4. f(x) = 3x5 - 4x3 + x + 5; p(x) = x3 - 2x + 7

**Use the remainder theorem to find f(c).**

5. f(x) = 3x3 - x2 + 5x - 4; c = 2 6. f(x) = x4 - 6x2 + 4x - 8; c = -3

**Use the factor theorem to show that x-c is a factor of f(x).**

7. f(x) = x3 + x2 - 2x + 12; c = -3 8. f(x) = x12 - 4096; c = -2

**Find a polynomial f(x) with leading coefficient 1 and having the given degree and zeros.**

9. degree 3; zeros -2, 0, 5 10. degree 4; zeros -2, ±1, 4

**Use synthetic division to find the quotient and remainder if the first polynomial is divided by the second.**

11. 2x3 - 3x2 + 4x - 5; x-2 12. x3 - 8x - 5; x + 3

13. 3x5 + 6x2 + 7; x + 2 14. 4x4 - 5x2 + 1; x - 1/2

**Use synthetic division to find f(c).**

15. f(x) = 2x3 + 3x2 - 4x + 4; c = 3 16. f(x) = -x3 + 4x2 + x; c = -2

**Use synthetic division to show that c is a zero of f(x).**

17. f(x) = 3x4 + 8x3 - 2x2 - 10x + 4; c = -2 18. f(x) = 4x3 - 6x2 + 8x - 3; c = 1/2

**Find all values of k such that f(x) is divisible by the given linear polynomial.**

19. f(x) = kx3 + x2 + k2x + 3k2 + 11; x + 2