Use the remainder theorem to find the remainder of when f(x) is divided by the given binomial (x – k). According to the factor theorem, state whether the binomial is a factor of f(x).

1. $f(x) = x^3 - x^2 - x - 15; x - 3$

2. $f(x) = 2x^3 - 4x^2 + x - 2; x - 3$

3. $f(x) = 3x^3 - 4x^2 + x + 3; x + 1$

4. $f(x) = 2x^3 - 6x^2 - 12x + 16; x + 2$

5. $f(x) = x^4 - x^3 + x^2 + x - 12; x - 2$

6. $f(x) = 2x^4 + 3x^3 - 14x^2 - 15x; x + 1$