$a = x^5 + 3x^4 - 5x^3 - 3x^2 + 2x + 2$

$b = x^5 + x^4 - 2x^3 + 4x^2 + x + 5$

a) $F_2[x]$ $\quad a = x^5 + x^4 + x^3 + x^2 \qquad b = x^5 + x^4 + x + 1$

$x^5 + x^4 + x^3 + x^2 = (x^5 + x^4 + x + 1)(1) + (x^3 + x^2 + x + 1)$

$x^5 + x^4 + x + 1 = (x^3 + x^2 + x + 1)(x^2 + 1) + (0)$

$\gcd(x^5 + x^4 + x^3 + x^2,\ x^5 + x^4 + x + 1) = x^3 + x^2 + x + 1$

b) $F_3[x]$ $\quad a = x^5 + x^3 + 2x + 2 \qquad b = x^5 + x^4 + x^3 + x^2 + x + 2$

$x^5 + x^3 + 2x + 2 = (x^5 + x^4 + x^3 + x^2 + x + 2)(1) + (2x^4 + 2x^2 + x)$

$x^5 + x^4 + x^3 + x^2 + x + 2 = (2x^4 + 2x^2 + x)(2x + 2) + (x^2 + 2x + 2)$

$2x^4 + 2x^2 + x = (x^2 + 2x + 2)(2x^2 + 2x) + (0)$

$\gcd(x^5 + x^3 + 2x + 2,\ x^5 + x^4 + x^3 + x^2 + x + 2) = x^2 + 2x + 2$

c) $F_5(x)$ $\quad a = x^5 + 3x^4 + 2x^2 + 2x + 2 \qquad b = x^5 + x^4 + 3x^3 + 4x^2 + x$

$x^5 + 3x^4 + 2x^2 + 2x + 2 = (x^5 + x^4 + 3x^3 + 4x^2 + x)(1) + (2x^4 + 2x^3 + 3x^2 + x + 2)$

$x^5 + x^4 + 3x^3 + 4x^2 + x = (2x^4 + 2x^3 + 3x^2 + x + 2)(3x) + (4x^3 + x^2)$

$2x^4 + 2x^3 + 3x^2 + x + 2 = (4x^3 + x^2)(3x + 1) + (2x^2 + x + 2)$

$4x^3 + x^2 = (2x^2 + x + 2)(2x + 2) + (4x + 1)$

$2x^2 + x + 2 = (4x + 1)(3x + 2) + (0)$

$\gcd(x^5 + 3x^4 + 2x^2 + 2x + 2,\ x^5 + x^4 + 3x^3 + 4x^2 + x) = x + 1$

d) $F_7[x]$ $\quad a = x^5 + 3x^4 + 2x^3 + 4x^2 + 2x + 2 \qquad b = x^5 + x^4 + 5x^3 + 4x^2 + x + 5$

$x^5 + 3x^4 + 2x^3 + 4x^2 + 2x + 2 = (x^5 + x^4 + 5x^3 + 4x^2 + x + 5)(1) + (2x^4 + 4x^3 + x + 4)$

$x^5 + x^4 + 5x^3 + 4x^2 + x + 5 = (2x^4 + 4x^3 + x + 4)(4x + 3) + (3x)$

$2x^4 + 4x^3 + x + 4 = (3x)(3x^3 + 6x^2 + 5) + (4)$

$3x = (4)(6x) + 0$

$\gcd = 1$