The field GF(8)

$\boldsymbol{p(x) = x^3 + x + 1}$ is an irreducible polynomial in $Z_2[x]$.

The eight polynomials of degree less than 3 in $Z_2[x]$ form a field with 8 elements, usually called GF(8).

In GF(8), we multiply two elements by multiplying the polynomials and then reducing the product modulo **p(x)**.

product mod $p(x)$	**0**	**1**	**x**	**$x+1$**	**x^2**	**x^2+1**	**x^2+x**	**x^2+x+1**
0	0	0	0	0	0	0	0	0
1	0	1	x	$x+1$	x^2	x^2+1	x^2+x	x^2+x+1
x	0	x	x^2	x^2+x	$x+1$	1	x^2+x+1	x^2+1
$x+1$	0	$x+1$	x^2+x	x^2+1	x^2+x+1	x^2	1	x
x^2	0	x^2	$x+1$	x^2+x+1	x^2+x	x	x^2+1	1
x^2+1	0	x^2+1	1	x^2	x	x^2+x+1	$x+1$	x^2+x
x^2+x	0	x^2+x	x^2+x+1	1	x^2+1	$x+1$	x	x^2
x^2+x+1	0	x^2+x+1	x^2+1	x	1	x^2+x	x^2	$x+1$