

COUNTING SOLUTIONS OVER \mathbb{F}_p

The equation $X^2 + 1$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	1	0	2	0	0	2	2	0	0	2	0	2	2	0	0	2	0	2	0	0	2	0	0	2	2	2	0	0	2	2	0	0
$p \bmod 4$	2	3	1	3	3	1	1	3	3	1	3	1	1	3	3	1	3	1	3	3	1	3	3	1	1	1	3	3	1	1	3	3

The equation $X^2 - 3$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	1	1	0	0	2	2	0	0	2	0	0	2	0	0	2	0	2	2	0	2	2	0	2	0	2	0	0	2	2	0	0	2
$p \bmod 12$	2	3	5	7	11	1	5	7	11	5	7	1	5	7	11	5	11	1	7	11	1	7	11	5	1	5	7	11	1	5	7	11

The equation $1 + X + X^2$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	0	1	0	2	0	2	0	2	0	0	2	2	0	2	0	0	0	2	2	0	2	2	0	0	2	0	2	0	2	0	2	0
$p \bmod 3$	2	0	2	1	2	1	2	1	2	2	1	1	2	1	2	2	2	1	1	2	1	1	2	2	1	2	1	2	1	2	1	2

The equation $X^2 + 2X + 3$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	1	2	0	0	2	0	2	2	0	0	0	0	2	2	0	0	2	0	2	0	2	0	2	2	2	0	0	2	0	2	0	2
$p \bmod 8$	2	3	5	7	3	5	1	3	7	5	7	5	1	3	7	5	3	5	3	7	1	7	3	1	1	5	7	3	5	1	7	3

The equation $X^2 - X - 1$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	0	0	1	0	2	0	0	2	0	2	2	0	2	0	0	0	2	2	0	2	0	2	0	2	0	2	0	0	2	0	0	2
$p \bmod 10$	2	3	5	7	1	3	7	9	3	9	1	7	1	3	7	3	9	1	7	1	3	9	3	9	7	1	3	7	9	3	7	1

The equation $X^5 + 20X + 16$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	1	0	1	2	2	0	2	0	1	2	0	1	2	2	0	0	0	0	0	2	0	2	1	1	0	2	2	0	0	2	1	0

Sato-Tate error term for $Y^2 = X^3 + 1$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	0	0	0	-4	0	2	0	8	0	0	-4	-10	0	8	0	0	0	14	-16	0	-10	-4	0	0	14	0	20	0	2	0	20	0

Sato-Tate error term for $Y^2 = X^3 - X - 1$:

p	2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67	71	73	79	83	89	97	101	103	107	109	113	127	131
#sols	0	3	-2	4	-2	-5	4	2	-1	-7	3	2	-9	8	-9	2	0	-2	-14	3	-3	6	-8	12	0	2	8	-2	0	-20	17	15