2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199

Problem 3

Count # of lattice points with even X-coord in the interior of the triangle (0,0)-(7,0)-(7,5). Count # lattice points in the interior of (0,0)-(7/2, 0)- (7/2, 5/2).

(Background) Eisenstein's Lemma

> Is 5 **QR** or **non-QR** (mod 7)?



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Problem 3

Eisenstein's Lemma

```
M = # of lattice points with even
X-coord in the interior of
(0,0)-(7,0)-(7,5).
```

N = # of lattice points in (0,0)-(7/2, 0)-(7/2, 5/2).

Then

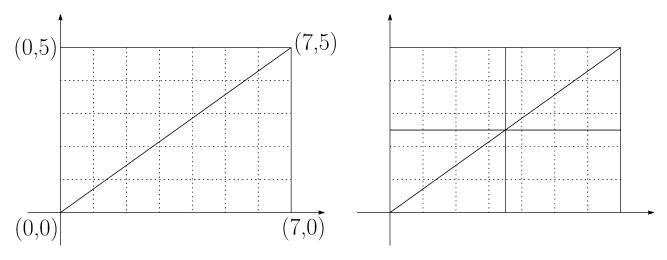
 $M \equiv N \pmod{2}$.



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Problem 3

> Count # of lattice points.



Answer M = 7, N = 3



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2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 19

Problem 3

> Confirm Eisenstein's Lemma

$$M = 7, N = 3$$

$$M \equiv N \pmod{2}$$

M, N are odd

⇔ 5 is not QR (mod 7)



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