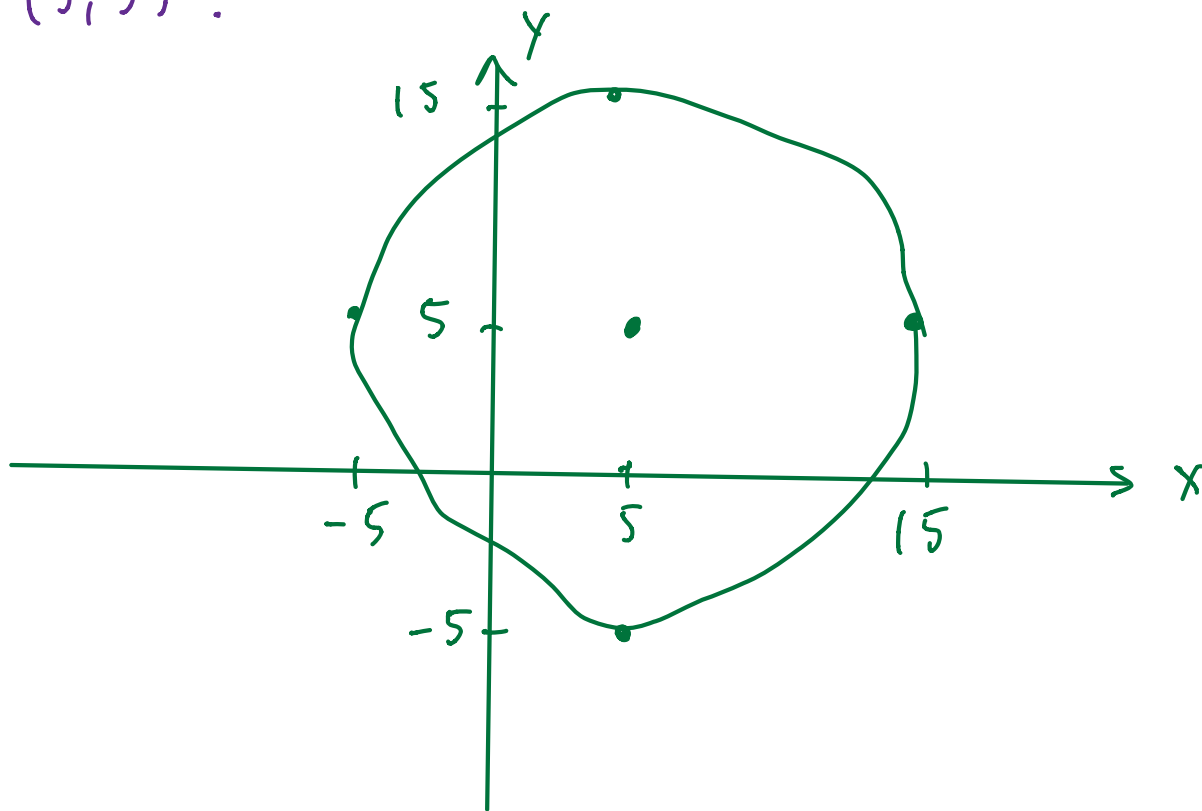


For how many integers x is the point $(x, -x)$ inside or on the circle of radius 10 centred at $(5, 5)$?



First we draw a graph.

The equation of the circle is

$$(x-5)^2 + (y-5)^2 = 10^2$$

↑
centre $(5, 5)$

↑
radius 10

So the area inside the circle can be described by the inequality

$$(x-5)^2 + (y-5)^2 \leq 100$$

Put in $y = -x$:

$$(x-5)^2 + (-x-5)^2 \leq 100$$

$$\Rightarrow x^2 - 10x + 25 + x^2 + 10x + 25 \leq 100$$

$$\Rightarrow 2x^2 + 50 \leq 100$$

$$\Rightarrow 2x^2 \leq 50$$

$$\Rightarrow x^2 \leq 25$$

So we have $x \in [-5, 5]$, and there

are $\underbrace{5}_{-ve} + 1 + \underbrace{5}_{+ve} = \boxed{11}$ possible values.