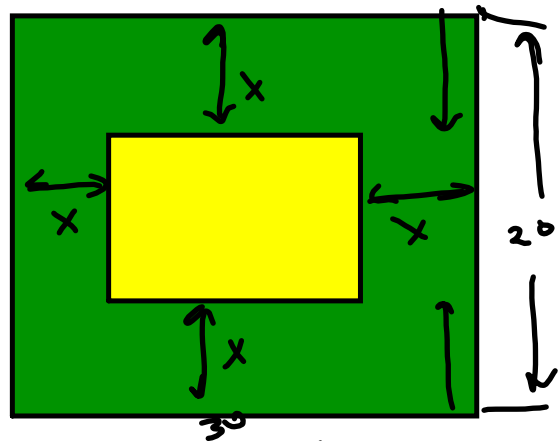Karen and Kurt's backyard has a width of 20 meters and a length of 30 meters. Karen and Kurt want to put a rectangular flower garden in the middle of the backyard leaving a strip of grass of uniform width around all sides of the flower garden. If they want to have 336 square meters of grass, what will be the width and length of the garden?

Area yard $-$ Area of garden $=$ Area of grass

$$(30)(20) - \left((20-2x)(30-2x)\right) = 336$$

$$600 - \left(600 - 40x - 60x + 4x^2\right) = 336$$

$$\cancel{600} - \cancel{600} + 100x - 4x^2 = 336$$

$$0 = 4x^2 - 100x + 336$$

$$0 = 4\left(x^2 - 25x + 84\right)$$

$$4(x-21)(x-4) = 0 \qquad \overset{84}{\wedge}$$

$$4 \neq 0 \quad x-21=0 \quad x-4=0 \quad -21+-4=-25$$

$$X = 21 \quad X = 4$$