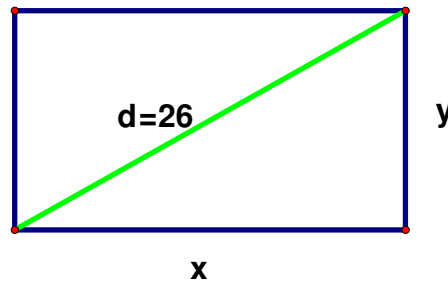


Find the dimensions of a rectangle that has a diagonal of length 26 centimeters and a perimeter of length 68 centimeters.

- We first sketch the rectangle:



- Since the perimeter is 68 cm, we have $2x+2y = 68$.
- From the Pythagorean theorem, we obtain $x^2 + y^2 = 676$.
- Now solve the system of equations:
$$\begin{aligned} x+y &= 34 \\ x^2+y^2 &= 676 \end{aligned}$$
- $y = 34 - x$, $x^2+(34-x)^2 = 676$, $x^2+1156-68x+x^2 = 676$
- $2x^2-68x+480 = 0$, $x^2-34x+240=0$, $(x-24)(x-10)=0$
- So $x = 24$, $y = 10$ or $x = 10$, $y = 24$