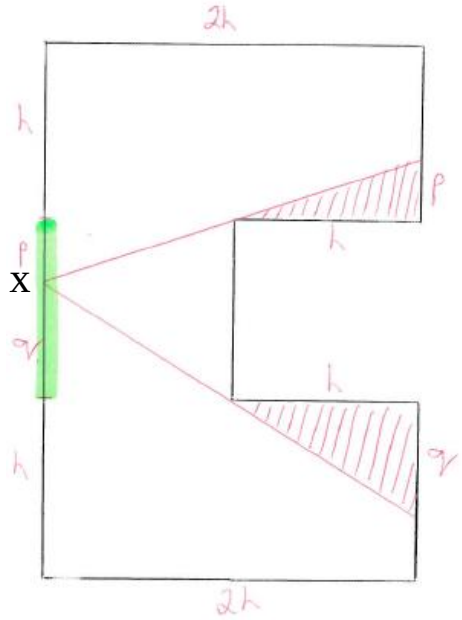
Beta Mathematics p267

Security Sensors Investigation

2(d) What percentage of the room is not covered by the placement in part c?

The diagram below shows that the wall sensor can be placed anywhere on the wall highlighted in green.



The longest sides of the pentomino are 3*h* and 2*h* (as shown)

Let's assume the wall sensor is at the point marked X, dividing the green part in the ratio $p : q$, where $p + q = h$

The area of the whole room is $5h^2$ (we are given that it is a pentomino)

The area of the shaded triangle in the top part is $\frac{1}{2}ph$

The area of the shaded triangle in the bottom part is $\frac{1}{2}qh$

The total shaded area is $\frac{1}{2}ph+\frac{1}{2}qh=\frac{1}{2}h(p+q)=\frac{1}{2}h\times h=\frac{1}{2}h^2$

$\frac{1}{2}h^2$ is 10% of $5h^2$.