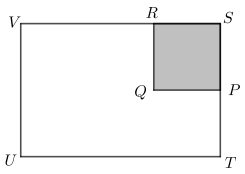


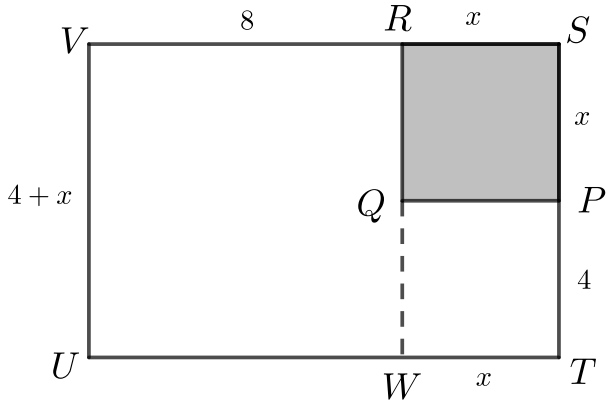
Problem of the Week
Problem D and Solution
Shady Square

Problem

Rectangle $STUV$ has square $PQRS$ removed, leaving an area of 92 m^2. Side PT is 4 m in length and side RV is 8 m in length. What is the area of rectangle $STUV$?

Solution

Let x represent the side length of square $PQRS$. In the diagram, extend RQ to intersect TU at W. This creates rectangle $PTWQ$ and rectangle $RWUV$. Then $UV = PT + SP = (4 + x)$ m and $TW = RS = x$ m.



$$\begin{aligned}
\text{Area } PTWQ + \text{Area } RWUV &= \text{Remaining Area} \\
PT \times TW + RV \times UV &= 92 \\
4x + 8(4 + x) &= 92 \\
4x + 32 + 8x &= 92 \\
12x + 32 &= 92 \\
12x &= 60 \\
x &= 5 \text{ m}
\end{aligned}$$

Since $x = 5$ m, $SV = 8 + x = 13$ m and $UV = 4 + x = 9$ m.

Therefore, the original area of rectangle $STUV$ is $SV \times UV = 13 \times 9 = 117$ m^2.