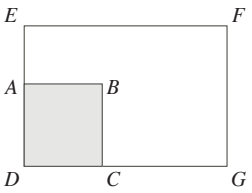


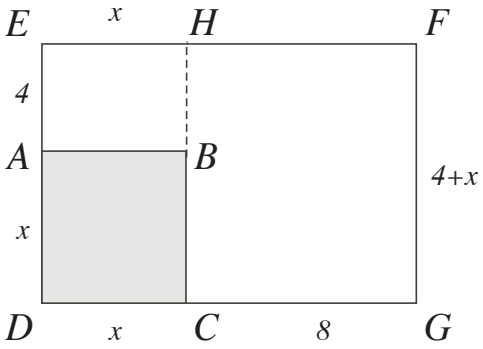
Problem of the Week
Problem D and Solution
The Case of the Missing Square

Problem

Rectangle $DEFG$ has square $ABCD$ removed leaving an area of 92 m^2. Side $AE = 4$ m and side $CG = 8$ m. Determine the original area of rectangle $DEFG$.

Solution

Let x represent the side length of square $ABCD$. In the diagram, extend CB to intersect EF at H. This creates rectangle $AEHB$ and rectangle $CHFG$. Then $FG = EA + AD = (4 + x)$ m and $EH = DC = x$ m.



$$\begin{aligned}
\text{Area } AEHB + \text{Area } CHFG &= \text{Remaining Area} \\
AE \times EH + CG \times FG &= 92 \\
4x + 8(4 + x) &= 92 \\
4x + 32 + 8x &= 92 \\
12x + 32 &= 92 \\
12x &= 60 \\
x &= 5 \text{ m}
\end{aligned}$$

Since $x = 5$ m, $DG = 8 + x = 13$ m and $FG = 4 + x = 9$ m. The original area of rectangle $DEFG = DG \times FG = 13 \times 9 = 117$ m^2.