

## Problem of the Week

### Problem D and Solution

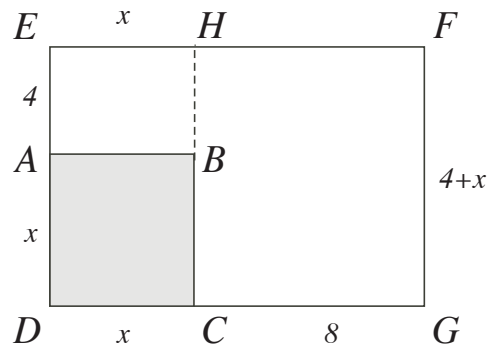
#### The Case of the Missing Square

#### Problem

Rectangle  $DEFG$  has square  $ABCD$  removed leaving an area of  $92 \text{ m}^2$ . Side  $AE = 4 \text{ m}$  and side  $CG = 8 \text{ m}$ . 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  $FG = EA + AD = (4 + x) \text{ m}$  and  $EH = DC = x \text{ m}$ .



$$\text{Area } AEHB + \text{Area } CHFG = \text{Remaining Area}$$

$$AE \times EH + CG \times FG = 92$$

$$4x + 8(4 + x) = 92$$

$$4x + 32 + 8x = 92$$

$$12x + 32 = 92$$

$$12x = 60$$

$$x = 5 \text{ m}$$

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

