

## Problem of the Week

### Problem D and Solution

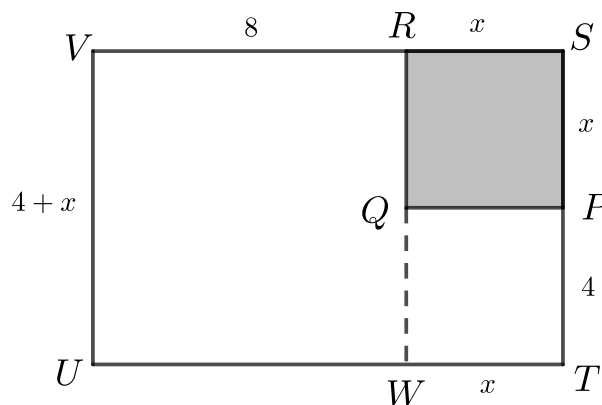
#### Shady Square

#### Problem

Rectangle  $STUV$  has square  $PQRS$  removed, leaving an area of  $92 \text{ m}^2$ . Side  $PT$  is  $4 \text{ m}$  in length and side  $RV$  is  $8 \text{ m}$  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  $UV = PT + SP = (4 + x) \text{ m}$  and  $TW = RS = x \text{ m}$ .



$$\text{Area } PTWQ + \text{Area } RWUV = \text{Remaining Area}$$

$$PT \times TW + RV \times UV = 92$$

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

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

$$12x + 32 = 92$$

$$12x = 60$$

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

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

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