

Multiplying Two-Digit Numbers in Parts

The picture illustrates the multiplication 18×27 using an area model.

The sides of the **WHOLE** rectangle are 18 and 27. But it is divided into four parts. The areas of the partial rectangles are:

$$10 \times 20 = 200 \text{ (top left)}$$

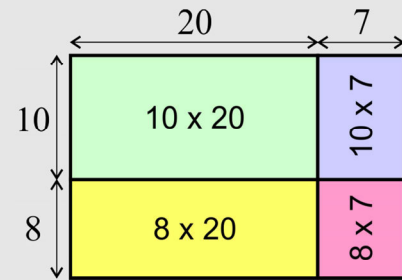
$$10 \times 7 = 70 \text{ (top right)}$$

$$8 \times 20 = 160 \text{ (bottom left)}$$

$$8 \times 7 = 56 \text{ (bottom right)}$$

Of course, we add those to find the total area:

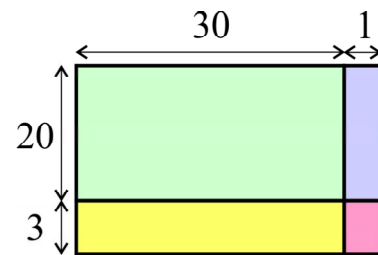
$$200 + 70 + 160 + 56 = 486 \text{ square units}$$



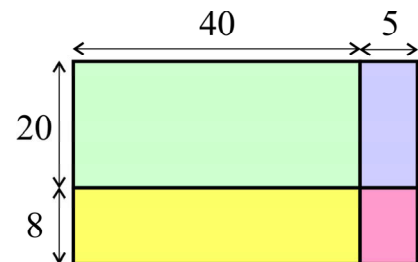
$$\begin{aligned} 18 \times 27 &= 10 \times 20 + 10 \times 7 \\ &\quad + 8 \times 20 + 8 \times 7 \\ &= 200 + 70 + 160 + 56 \\ &= 486 \end{aligned}$$

1. Fill in the missing numbers. Write the area of the *whole* rectangle as a SUM of the areas of the *smaller* rectangles. Also find the total area.

a. $23 \times 31 =$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $+$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $=$



b. $28 \times 45 =$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $+$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $=$



c. _____ $\times$ _____ $=$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $+$ _____ $\times$ _____ $+$ _____ $\times$ _____
 $=$

