G5-M5-Lesson 13

1. Find the area of the following rectangles. Draw an area model if it helps you.

a. $\frac{35}{4}$ ft $\times 2\frac{3}{7}$ ft

I can use multiplication to find the area.

$$\frac{35}{4} \times \frac{17}{7}$$

I can rename $2\frac{3}{7}$ as a fraction greater than one, $\frac{17}{7}$.

$$= \frac{^{5}\cancel{35} \times 17}{4 \times \cancel{7}^{1}}$$

$$= \frac{5 \times 17}{4 \times 1}$$

35 and 7 have a common factor of 7. $35 \div 7 = 5$, and $7 \div 7 = 1$. The new numerator is 5×17, and the denominator is 4×1.

$$= \frac{85}{4}$$

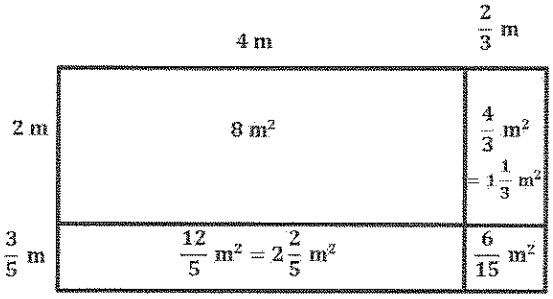
$$= 21\frac{1}{4}$$

I can use division to convert from a fraction to a mixed number. 85 divided by 4 is equal to $21\frac{1}{4}$.

$$\text{Area} = 21\frac{1}{4}\text{ ft}^2$$

b. $4\frac{2}{3}$ m $\times 2\frac{3}{5}$ m

I use the area model to solve this problem.



I can multiply to find all four partial products.

$2\text{ m} \times 4\text{ m} = 8\text{ m}^2$

$2\text{ m} \times \frac{2}{3}\text{ m} = \frac{4}{3}\text{ m}^2 = 1\frac{1}{3}\text{ m}^2$

$\frac{3}{5}\text{ m} \times 4\text{ m} = \frac{12}{5}\text{ m}^2 = 2\frac{2}{5}\text{ m}^2$

$\frac{3}{5}\text{ m} \times \frac{2}{3}\text{ m} = \frac{6}{15}\text{ m}^2$

I can add all four partial products to find the area.

$$8\text{ m}^2 + 1\frac{1}{3}\text{ m}^2 + 2\frac{2}{5}\text{ m}^2 + \frac{6}{15}\text{ m}^2$$

$$= 11\text{ m}^2 + \frac{1}{3}\text{ m}^2 + \frac{2}{5}\text{ m}^2 + \frac{6}{15}\text{ m}^2$$

$$= 11\text{ m}^2 + \frac{5}{15}\text{ m}^2 + \frac{6}{15}\text{ m}^2 + \frac{6}{15}\text{ m}^2$$

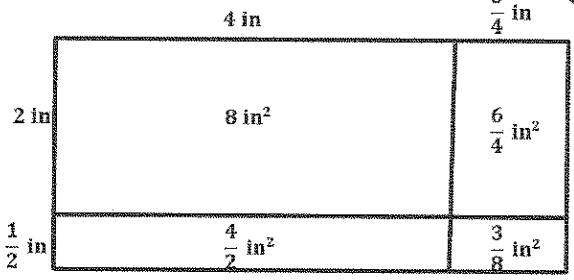
$$= 11\text{ m}^2 + \frac{17}{15}\text{ m}^2$$

$$= 11\text{ m}^2 + 1\frac{2}{15}\text{ m}^2$$

$$= 12\frac{2}{15}\text{ m}^2$$

$$\text{Area} = 12\frac{2}{15}\text{ m}^2$$

2. Meigan is cutting rectangles out of fabric to make a quilt. If the rectangles are $4\frac{3}{4}$ inches long and $2\frac{1}{2}$ inches wide, what is the area of five such rectangles?



I can find the area of 1 rectangle, and then multiply by 5 to find the total area of 5 rectangles.

I draw an area model to help solve for the area of 1 rectangle.

I can add up the four partial products. The area of 1 rectangle is $11\frac{7}{8}$ square inches.

$$4\frac{3}{4} \times 2\frac{1}{2}$$
$$= (4 \times 2) + \left(4 \times \frac{1}{2}\right) + \left(\frac{3}{4} \times 2\right) + \left(\frac{3}{4} \times \frac{1}{2}\right)$$
$$= 8 + \frac{4}{2} + \frac{6}{4} + \frac{3}{8}$$
$$= 8 + 2 + 1\frac{2}{4} + \frac{3}{8}$$
$$= 11 + \frac{4}{8} + \frac{3}{8}$$
$$= 11\frac{7}{8}$$

$1\ \textit{unit} = 11\frac{7}{8}\ \text{in}^2$

$5\ \textit{units} = 5 \times 11\frac{7}{8}\ \text{in}^2$

The area of 1 rectangle or 1 unit is equal to $11\frac{7}{8}$ square inches. I can multiply by 5 to find the area of 5 rectangles or 5 units.

$$(5 \times 11) + \left(5 \times \frac{7}{8}\right)$$
$$= 55 + \frac{35}{8}$$
$$= 55 + 4\frac{3}{8}$$
$$= 59\frac{3}{8}$$

The area of five rectangles is $59\frac{3}{8}$ square inches.