

## Pre-Algebra

### Multiplying Mixed Numbers

The two methods shown below are equivalent. Use whichever one you like best.

#### Box Method

In the box method,

- Create a 2x2 array of multiplications from the parts of the fractions.
- Perform the 4 multiplications.
- Add the results.

**Example:** Multiply  $(2\frac{3}{7}) \cdot (4\frac{2}{5})$

<b>Multiply</b>	<b>2</b>	<b><math>\frac{3}{7}</math></b>
<b>4</b>	<b>8</b>	<b><math>\frac{12}{7}</math></b>
<b><math>\frac{2}{5}</math></b>	<b><math>\frac{4}{5}</math></b>	<b><math>\frac{6}{35}</math></b>

The result is obtained by adding the results of the 4 separate multiplications.

$$\begin{aligned}
 \left(2\frac{3}{7}\right) \cdot \left(4\frac{2}{5}\right) &= 8 + \frac{12}{7} + \frac{4}{5} + \frac{6}{35} \\
 &= 8 + \frac{60 + 28 + 6}{35} \\
 &= 8 + \frac{94}{35} \\
 &= 8 + 2\frac{24}{35} \\
 &= 10\frac{24}{35}
 \end{aligned}$$

#### Improper Fraction Method

In the Improper Fraction Method,

- Change the two mixed numbers to improper fractions.
- Multiply the improper fractions.
- Change the product back to a mixed number.

**Example:** Multiply  $(2\frac{3}{7}) \cdot (4\frac{2}{5})$

$$\begin{aligned}
 \left(2\frac{3}{7}\right) \cdot \left(4\frac{2}{5}\right) &= \frac{17}{7} \cdot \frac{22}{5} \\
 &= \frac{374}{35} \\
 &= 10\frac{24}{35}
 \end{aligned}$$