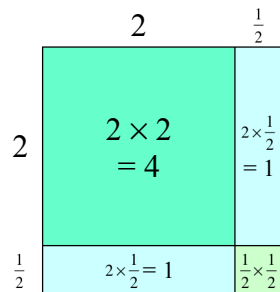


4.3 Multiplying and Dividing Mixed Numbers

The following is an area model of the product $2\frac{1}{2} \times 2\frac{1}{2}$



Total area:

$$4 + 1 + 1 + \frac{1}{4} = 6\frac{1}{4}$$

Recall that we can write $2\frac{1}{2} = \frac{5}{2}$. So then $2\frac{1}{2} \times 2\frac{1}{2} = \frac{5}{2} \times \frac{5}{2} = \frac{25}{4} = 6\frac{1}{4}$. This is a much simpler method of multiplying mixed numbers! For reference, here are the two properties we will use in this section:

Writing a Mixed Number as an Improper Fraction	
<i>Step</i>	<i>Example</i>
1.	Multiply the denominator of the fraction by the whole number.
2.	Add the numerator of the fraction to the product of Step 1.
3.	Write the sum from Step 2 as the numerator of the improper fraction over the original denominator.
$3\frac{4}{5} = 3\frac{4}{5} = \frac{5 \cdot 3 + 4}{5} = \frac{19}{5}$	

Multiplication of Fractions Property	
For any real numbers a , b , c , and d , ($b \neq 0$ and $d \neq 0$)	$\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$

Division of Fractions Property	
For any real numbers a , b , c , and d , ($b \neq 0$, $c \neq 0$, and $d \neq 0$)	$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$

<i>Demonstration Problems</i>	<i>Practice Problems</i>
<p>Multiply and simplify.</p> <p>1. (a) $5\frac{2}{3} \cdot \frac{6}{17} =$</p> <p>2. (a) $5\frac{5}{7} \left(-2\frac{5}{8}\right) =$</p> <p>Divide and simplify.</p> <p>3. (a) $4\frac{3}{8} \div 7 =$</p> <p>4. (a) $2\frac{2}{3} \div 1\frac{1}{3} =$</p>	<p>Multiply and simplify.</p> <p>1. (b) $3\frac{1}{3} \cdot \frac{5}{8} =$</p> <p>2. (b) $2\frac{4}{5} \left(-1\frac{7}{8}\right) =$</p> <p>Divide and simplify.</p> <p>3. (b) $3\frac{4}{7} \div 5 =$</p> <p>4. (b) $2\frac{1}{2} \div 1\frac{1}{4} =$</p>
Answers: 1. (b) $\frac{25}{12}$; 2. (b) $-\frac{21}{4}$; 3. (b) $\frac{5}{7}$; 4. (b) 2	

<i>Demonstration Problems</i>	<i>Practice Problems</i>
<p>Simplify.</p> <p>5. (a) $\frac{4+6}{11-2} =$</p> <p>6. (a) $\frac{6-3(5)}{3^2+3} =$</p> <p>7. (a) $\frac{(11-7)^2}{11^2-7^2} =$</p> <p>8. (a) $\frac{8(-2)+4(-3)}{-5(2)+3} =$</p>	<p>Simplify.</p> <p>5. (b) $\frac{4+8}{5-3} =$</p> <p>6. (b) $\frac{4-2(3)}{2^2+2} =$</p> <p>7. (b) $\frac{(8-4)^2}{8^2-4^2} =$</p> <p>8. (b) $\frac{4(-3)+6(-2)}{-3(2)-2} =$</p>
Answers: 5. (b) 6; 6. (b) $-\frac{1}{3}$; 7. (b) $\frac{1}{3}$; 8. (b) 3	