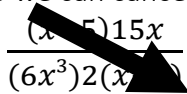


Multiplying Rational Expressions Guide

- ① Factor out each numerator and each denominator, if possible (start by looking for a GCF to take out)
- ② “Set up” to multiply by putting each item in the numerator and each item in the denominator next to one another to be multiplied, and then cancel out common terms/factors
- ③ Multiply what’s left in the numerator, and multiply what’s left in the denominator, if possible.
- ④ Take out (factor out) any remaining common terms in the numerator and denominator

Example:

Find the product: $\frac{x+5}{6x^3} \cdot \frac{15x}{2x+10}$	
<p>① Factor out each numerator and each denominator, if possible (start by looking for a GCF to take out)</p> <p>The only thing that can be factored is $2x + 10 \rightarrow$ it can be factored as $2(x + 5)$</p> <p>So, we now have $\frac{x+5}{6x^3} \cdot \frac{15x}{2(x+5)}$</p>	
<p>② “Set up” to multiply by putting each item in the numerator and each item in the denominator next to one another to be multiplied, then cancel out common terms/factors</p> <p><i>Set up:</i></p> $\frac{(x+5)15x}{(6x^3)2(x+5)}$	<p><i>Cancel out common terms/factors:</i></p> <p>Both the numerator and denominator have the factor $(x + 5)$, so we can cancel each</p> <div style="text-align: center;">  $\frac{\cancel{(x+5)}15x}{(6x^3)2\cancel{(x+5)}}$ </div>
<p>③ Multiply what’s left in the numerator, and multiply what’s left in the denominator, if possible.</p> <p>There’s nothing left to multiply in the numerator, so we are left with $15x$ on top $\rightarrow \frac{15x}{12x^3}$</p> <p>We can multiply what’s left in the denominator, $(6x^3)2$ and we get $12x^3 \rightarrow \frac{15x}{12x^3}$</p>	
<p>④ Take out (factor out) any remaining common terms in the numerator and denominator</p> <p>The GCF of 15 and 12 is 3, and the GCF of the x’s is just x. So, the GCF of the numerator and denominator is $3x \rightarrow$ take a $3x$ out of the numerator and denominator, and we’re left with</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> $\frac{5}{4x^2}$ </div>	