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Example 1: Simplify

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$$\frac{4x}{3x^2 + 6x} =$$

We can simplify a fraction if $P(x)$ and $D(x)$ have a common factor

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$$\frac{4x}{3x^2 + 6x} =$$

We can simplify a fraction if $P(x)$ and $D(x)$ have a common factor

To see if $P(x)$ and $D(x)$ have common factors, we need to write them in factored form

$$P(x) = a \cdot (x - r_1) \cdot (x - r_2) \cdots (x - r_k)$$

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To factor the bottom, we can factor out $3x$

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Leaving us with:

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Note: $\frac{x}{x} = 1$ as long as $x \neq 0$, so this is equality is true for $x \neq 0$