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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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$$\frac{x+2}{3x^2+6x} = \frac{(x+2)}{\phantom{3x^2+6x}}$$

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

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$$\frac{x+2}{3x^2+6x} = \frac{\cancel{(x+2)}}{3x\cdot\cancel{(x+2)}} = \frac{1}{3x}$$

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Leaving us with: $$\frac{x+2}{3x^2+6x} = \frac{1}{3x}$$

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Leaving us with:

$$\frac{x+2}{3x^2+6x} = \frac{1}{3x}$$

Note: $\frac{(x+2)}{(x+2)} = 1$ for $(x+2) \neq 0$, so this equality is true for $x \neq -2$