4.1.9 - Multiplication & Division By Factoring

4.1 - Algebra - Expressions

Leaving Certificate Mathematics

Higher Level ONLY

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Example 1

Q.   Simplify $\frac{2x^2-32}{2x^2-9x+4} \times \frac{2x-1}{x^2+4x}$.

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$$\frac{2x^2 - 32}{2x^2 - 9x + 4} \times \frac{2x - 1}{x^2 + 4x} \;=\; \frac{2(x^2 - 16)}{(2x - 1)(x - 4)} \times \frac{2x - 1}{x(x + 4)}$$

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&= \frac{2(x - 4)(x + 4)(2x - 1)}{(2x - 1)(x - 4)(x)(x + 4)}
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&= \frac{2(x - 4)(x + 4)(2x - 1)}{(2x - 1)(x - 4)(x)(x + 4)} \\
&= \frac{2}{x}
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Example 2

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$$\frac{x+2}{x-6} \div \frac{x^2+5x+6}{x^2-2x+24} \quad = \quad \frac{x+2}{x-6} \times \frac{x^2-2x+24}{x^2+5x+6}$$

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Answer:

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\begin{aligned}
\frac{x+2}{x-6} \div \frac{x^2+5x+6}{x^2-2x+24} &= \frac{x+2}{x-6} \times \frac{x^2-2x+24}{x^2+5x+6} \\
&= \frac{(x+2)(x-6)(x+4)}{(x-6)(x+2)(x+3)}
\end{aligned}
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Answer:

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\begin{aligned}
\frac{x+2}{x-6} \div \frac{x^2+5x+6}{x^2-2x+24} &= \frac{x+2}{x-6} \times \frac{x^2-2x+24}{x^2+5x+6} \\
&= \frac{(x+2)(x-6)(x+4)}{(x-6)(x+2)(x+3)} \\
&= \frac{x+4}{x+3}
\end{aligned}
$$