Objective #3: Divide polynomials by quadratics

1. Divide: $x^4 + x^3 - 11x^2 - 5x + 10$ by $x^2 - 2x - 3$

[A] $x^2 + 3x - 2 + \dfrac{4}{x^2 - 2x - 3}$

[B] $x^2 + 3x + 2 - \dfrac{4}{x^2 - 2x - 3}$

[C] $x^2 - 3x - 3 + \dfrac{6}{x^2 - 2x - 3}$

[D] $x^2 - 3x + 1 - \dfrac{6}{x^2 - 2x - 3}$

$$
\begin{array}{r|l}
 & x^2 + 3x - 2 \\
\hline
x^2 - 2x - 3 & x^4 + x^3 - 11x^2 - 5x + 10 \\
 & -(x^4 - 2x^3 - 3x^2) \\
\hline
 & 3x^3 - 8x^2 - 5x \\
 & -(3x^3 - 6x^2 - 9x) \\
\hline
 & -2x^2 + 4x + 10 \\
 & -(-2x^2 + 4x + 6) \\
\hline
 & 4
\end{array}
$$

$$\boxed{x^2 + 3x - 2 + \frac{4}{x^2 - 2x - 3}}$$

Objective #3: Divide polynomials by quadratics

2. $\dfrac{9x^4+3x^3-15x^2-11x-2}{3x^2-3x-2}$

[A] $3x^2+4x-1$ [B] $3x^2-2x+1$ [C] $3x^2+4x+1$ [D] $3x^2-2x-1$

$$
\begin{array}{r|l}
 & 3x^2+4x+1 \\
\hline
3x^2-3x-2 & 9x^4+3x^3-15x^2-11x-2 \\
 & -(9x^4-9x^3-6x^2) \\
\hline
 & 12x^3-9x^2-11x \\
 & -(12x^3-12x^2-8x) \\
\hline
 & 3x^2-3x-2 \\
 & -(3x^2-3x-2) \\
\hline
 & 0
\end{array}
$$

Objective #3: Divide polynomials by quadratics

3. $\dfrac{3x^4 - 6x^3 - 15x^2 + 12x + 18}{3x^2 - 6}$

[A] $x^2 - 2x - 3$ [B] $x^2 - 2x + 3$ [C] $x^2 - 7x - 3$ [D] $x^2 - 7x + 3$

$$
\begin{array}{r|l}
 & x^2 - 2x - 3 \\
\hline
3x^2 + 0x - 6 & 3x^4 - 6x^3 - 15x^2 + 12x + 18 \\
 & -(3x^4 + 0x^3 - 6x^2) \\
\hline
 & -6x^3 - 9x^2 + 12x \\
 & -(-6x^3 + 0x^2 + 12x) \\
\hline
 & -9x^2 + 0x + 18 \\
 & -(-9x^2 + 0x + 18) \\
\hline
 & 0
\end{array}
$$

Objective #3: Divide polynomials by quadratics

4. Divide: $2x^4 + 6x^3 - 2x - 12$ by $x^2 + 2x - 3$

$$
\begin{array}{r|l}
 & 2x^2 + 2x + 2 \\
\hline
x^2+2x-3 & 2x^4 + 6x^3 + 0x^2 - 2x - 12 \\
 & -(2x^4 + 4x^3 - 6x^2) \\
\hline
 & 2x^3 + 6x^2 - 2x \\
 & -(2x^3 + 4x^2 - 6x) \\
\hline
 & 2x^2 + 4x - 12 \\
 & -(2x^2 + 4x - 6) \\
\hline
 & -6
\end{array}
$$

$$\boxed{2x^2 + 2x + 2 - \frac{6}{x^2+2x-3}}$$