AM: Divide polynomials

4. Divide: $3x^4 - 7x^3 + 13x^2 - 12x + 14$ by $x^2 - 2x + 2$

$$
\begin{array}{r}
3x^2 - x + 5 \\
x^2 - 2x + 2 \;\overline{)\; 3x^4 - 7x^3 + 13x^2 - 12x + 14} \\
\underline{-(3x^4 - 6x^3 + 6x^2)} \\
-x^3 + 7x^2 - 12x \\
\underline{-(-x^3 + 2x^2 - 2x)} \\
5x^2 - 10x + 14 \\
\underline{-(5x^2 - 10x + 10)} \\
4
\end{array}
$$

AM: Divide polynomials by quadratics

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

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

LO: I know the divisor is x^2-2x-3 and the dividend is $x^4+x^3-11x^2-5x+10$. The result of my division, or the quotient is x^2+3x-2 and my remainder is 4.

Therefore I can write my answer as

_____ or _____.

3

AM: Divide polynomials by quadratics

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

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

Divisor	$d(x) = x^2 + 2x - 3$
Dividend	$f(x) = 2x^4 + 6x^3 - 2x - 12$
Quotient	$q(x) = 2x^2 + 2x + 2$
Remainder	$r(x) = -6$
Fraction Form	$\frac{2x^4 + 6x^3 - 2x - 12}{x^2 + 2x - 3} = 2x^2 + 2x + 2 + \frac{-6}{x^2 + 2x - 3}$
Polynomial Form	$2x^4 + 6x^3 - 2x - 12 = (2x^2 + 2x + 2)(x^2 + 2x - 3) + -6$

Fraction form

$$\frac{f(x)}{d(x)} = q(x) + \frac{r(x)}{d(x)}$$

Polynomial Form

$$f(x) = q(x) \cdot d(x) + r(x)$$

dividend

AM: Divide polynomials

2. Divide $-3x^3-3x-7$ by $x-3$ divisor

[A] $-3x^2-12x+36+\frac{101}{x-3}$

[B] $-3x^2-9x-30-\frac{97}{x-3}$ $\frac{r(x)}{d(x)}$

[C] $-3x^2-9x+24+\frac{62}{x-3}$

[D] $-3x^2-12x-43-\frac{129}{x-3}$

$$
\begin{array}{r|l}
x-3 & -3x^2-9x-30 \\
\hline
 & -3x^3+0x^2-3x-7 \\
 & -(-3x^3+9x^2) \\
\hline
 & -9x^2-3x \\
 & -(-9x^2+27x) \\
\hline
 & -30x-7 \\
 & -(-30x+90) \\
\hline
 & -97
\end{array}
$$