

Name \_\_\_\_\_

Date \_\_\_\_\_

## Precalculus Practice - Polynomial Zeros and Rational Functions

KEY! 😊

1. Divide the polynomial  $p(x) = -14x^3 - 51x^2 + 14x^4 + 19x + 15x^5 + 60$  by  $d(x) = 3x^2 + x - 7$ .

Divisor	$d(x) = 3x^2 + x - 7$
Dividend	$f(x) = 15x^5 + 14x^4 - 14x^3 - 51x^2 + 19x + 60$
Quotient	$q(x) = 5x^3 + 3x^2 + 6x - 12$
Remainder	$r(x) = 73x - 24$
Fraction Form	$\frac{15x^5 + 14x^4 - 14x^3 - 51x^2 + 19x + 60}{3x^2 + x - 7} = 5x^3 + 3x^2 + 6x - 12 + \frac{73x - 24}{3x^2 + x - 7}$
Polynomial Form	$15x^5 + 14x^4 - 14x^3 - 51x^2 + 19x + 60 = (5x^3 + 3x^2 + 6x - 12)(3x^2 + x - 7) + 73x - 24$

$$\begin{array}{r}
 5x^3 + 3x^2 + 6x - 12 \\
 \hline
 3x^2 + x - 7 \overline{) 15x^5 + 14x^4 - 14x^3 - 51x^2 + 19x + 60} \\
 \underline{-(15x^5 + 5x^4 - 35x^3)} \quad \downarrow \\
 9x^4 + 21x^3 - 51x^2 \\
 \underline{-(9x^4 + 3x^3 - 21x^2)} \quad \downarrow \\
 18x^3 + 30x^2 + 19x \\
 \underline{-(18x^3 + 6x^2 - 42x)} \quad \downarrow \\
 -36x^2 + 61x + 60 \\
 \underline{-(-36x^2 - 12x + 84)} \\
 73x - 24
 \end{array}$$