Algebra 2

4-04 Find Rational Zeros of Polynomial Functions (4.5)

The Remainder Theorem

- If a polynomial $f(x)$ is _____ by $x - k$, then the remainder is the value _____.

Use the Remainder Theorem to Evaluate a Polynomial

- To evaluate polynomial $f(x)$ at $x = k$ using the Remainder Theorem,

1. Use _____ division to divide the polynomial by $x - k$.
2. The _____ is the value $f(k)$.

Use the remainder theorem to evaluate $f(x) = 3x^4 - 5x^3 + x - 14$ at $x = 2$.

The Factor Theorem

- According to the *Factor Theorem*, k is a zero of $f(x)$ if and only if $(x - k)$ is a _____ of $f(x)$.

Use the Factor Theorem to Solve a Polynomial Equation

1. Use _____ division to divide the polynomial by the given _____ , $(x - k)$.
2. _____ that the remainder is 0.
3. If the quotient is _____ a quadratic, repeat steps 1 and 2 with _____ factor using the quotient as the polynomial.
4. If the quotient _____ a quadratic, _____ the quadratic quotient if possible.
5. Set each factor equal to _____ and solve for x.

Show that $x - 2$ is a factor of $x^3 + 7x^2 + 2x - 40$. Then find the remaining factors.

Show that $x + 2$ and $x - 1$ are factors of $x^4 - 4x^3 - 3x^2 + 14x - 8$. Then find the remaining factors.

Worksheet