Algebra II Pre-AP Classwork 6.4 - 6.5

Factor the following completely under the Real Domain:

1. $x^4 - 16$

2. $x^3 + x^2 - x - 1$

3. $x^3 - 125$

4. $27x^6 + 8y^3$

Divide using long division:

5. $\dfrac{x^4 - x^3 + 3x^2 - 3x + 2}{x - 6}$

6. $\dfrac{2x^5 - 4x^4 + 6x^2 - 3x + 2}{x^2 + x - 4}$

Divide using synthetic division:

7. $\dfrac{x^6 - 2x^4 - 3x^3 + x^2 - 3x - 5}{x + 3}$

8. Use the remainder theorem to find the remainder of $5x^3 + 2x^2 - 3x - 14$ when x = -2.

9. Use the factor theorem to determine whether or not -1 is a factor of $8x^4 - 3x^3 + 2x^2 - 3x - 16$

10. Decide if $x + 2$ is a factor of $f(x) = 3x^3 - 13x^2 - 18x + 40$. If so, Write $f(x)$ as a product of its linear factors.