Polynomial Long Division Handout

Find the quotient of each of the following using polynomial long division.

1) $\dfrac{6x^3 - 16x^2 + 17x - 6}{3x - 2}$

2) $\dfrac{3x^3 - 17x^2 + 15x - 25}{x - 5}$

3) $\dfrac{x^4 + 3x^2 + 1}{x^2 - 2x + 3}$

4) $\dfrac{x^4 - x^3 - 12x^2 - 2x + 8}{x - 4}$

5) $\dfrac{6x^3 + 10x^2 + x + 8}{2x^2 + 1}$

6) $\dfrac{3x^3 - 16x^2 - 72}{x - 6}$

7) $\dfrac{x^5 - 4x^4 + 4x^3 - 13x^2 + 3x - 1}{x^2 + 3}$

8) $\dfrac{2x^3 + 5x^2 + 2x + 15}{2x^2 - x + 5}$

9) **Is** $x + 2$ **a factor of** $x^3 + 8$ **?**

10) **Is** $x - 6$ **a factor of** $3x^3 - 16x^2 - 72$ **?**

11) **Describe the manner in which you determined whether or not the given binomials above were factors of their respective polynomials.**

12) **When a polynomial** $p(x)$ **is divided by** $x - 1$, **the quotient is** $-2x^2 + 3x + 5 + \dfrac{12}{x - 1}$.

What is $p(x)$ **? How did you find** $p(x)$ **?**