Chapter 1 Quiz Review

1) Determine if $2x + 5x^{-1}$ is a polynomial or not

2) For $2x^3 + 3x^4 + 5$, identify the coefficients, the variable, and the degree. And then name the polynomial.

3) Use $h(x) = x^2 - 3x + 8$.
   a) Find a polynomial $k(x)$ such that
      \[ h(x) + k(x) = 3x^2 + 5x + 10 \]
   b) Find a polynomial $m(x)$ such that
      \[ h(x) + m(x) = 2x^2 - 3 \]

4) Using both long and synthetic division divide $3x^4 + 2x^2 - 6x + 5$ by $x - 1$

5) Find the remainders when you divide each polynomial by $x - 4$
   a) $x^4 - 2$
   b) $x + 1$
   c) $x^2 + 2x + 3$
   d) $x^5 + x^3 + x$

6) What is the greatest number of solutions of a polynomial of degree 4 can have? Explain.

7) Is $x - 3$ a factor of $x^3 + 9x^2 + 23x + 15$?

8) Find the value of $a$ such that $x = -2$ is a solution of $-2x^3 + ax^2 - x - 2$

9) Simplify each expression.
   a) $(3x + 5)(4x^3 - 5x^2 - 4x + 1)$
   b) $(4x^3 - x^2 + 6) - (2x^2 + 7x - 5)$
   c) $(2x - 5x^4 + 7x^2) + (x^3 + 2x^4 - 3)$