Algebra II, Quiz 12.1-12.4

1. Which of the following expressions are polynomials in x?

a) $\frac{2x^3}{3} - 2x^8$

b) $\sqrt{3x} - x^2 + x$

c) $\frac{1}{x} + \frac{x^2}{2} + 4x$

d) $(x-1)(x+2)(x-3) - x^2(x+1)^2$

2. Given $p(t) = 4t^2 + t$ find the following values and simplify if possible:

a) $p(0)$

b) $p(-1)$

c) $p(2x+1)$

d) Values of t such that $p(t) = 0$

3. Write the following polynomials in standard form:

a) $x(x-1) + x^2(2-x)$

b) $2(x+1) - 3(x+2) + 4(x-3)$

4. Find the constant term of the polynomial $x(x-1)(x-2)(x-3)(x-4) + 5$

5. Find the zeroes of the polynomials below:

a) $x(x+4)(x-3)^2$

b) $(x^2-1)(x^2+1)(x-2)$

6. Give a formula for a polynomial of degree 3 which has a double zero when x=1 and a single zero at x=-3.

7. By multiplying by a **non-zero** constant, could the graph of the polynomial in question 6 pass through the point (-3, 4)? Could it pass through (0,1)? If yes, find the formula for the polynomial.

8) Answer the following questions for both a 6-degree polynomial and a 7-degree polynomial:

Can it have 8 zeroes?
Can it have 4 zeroes?
Can it have no zeroes?
What is the most zeroes it can have?