Name ______________________________________ 03/03/08
Pretest Chapter 6 Algebra 2

1. Identify the degree of the monomial

x^3y^2z **-6**

2. Rewrite each polynomial in standard form. Then identify the leading coefficient, degree, and number of terms. Name the polynomial.

$7x^3 - 11x + x^5 - 2$

a) write the terms in descending order $x^5 + 7x^3 - 11x + -2$

b) Leading coefficient **1**

c) Degree **5**

d) Terms **4**

e) Name **Quintic**

3. Add or subtract. Write your answer in standard form.

$(3x^2 + 7 + 2x) + (14x^3 + 5 + x^2 - x)$

$= 14x^3 + 4x^2 + x + 12$

4. Find each product.

$3ab(a^3 + 3ab^2 - 2b^3)$

$= 3a^4b + 9a^2b^3 - 6ab^4$

5. **Find each product.**

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

$=(3x-2)(-x^2+3x+2)$
$=-3x^3+9x^2+6x+2x^2-6x-4$
$=-3x^3+11x^2-4$

6. **Expand**

$(x+2)^4$

1	**4**	**6**	**4**	**1**
x^4	x^3	x^2	x^1	x^0
2^0	2^1	2^2	2^3	2^4

= $x^4+8x^3+24x^2+32x+16$

7. **Divide by using long division.**

$(6x^2+13x-8)\div(2x-1)$

=3x-8

8. **Divide by using synthetic division.**

$(3x^3 + 11x^2 + 11x + 15) \div (x + 3)$

$= 3x^2 + 2x + 5$

9. **Use synthetic substitution to evaluate the polynomial for the given value.**

$P(x) = x^3 + 2x^2 - 5x + 6 \quad \text{for} \quad x = -1$

$P(-1) = 12$

10. **Determine whether the given binomial is a factor of the polynomial P(x).**

$(x - 8); P(x) = x^5 - 8x^4 + 8x - 64$

Yes it is because the remainder after using synthetic division is zero

11. **Factor.**

$3t^3 - 21t^2 - 12t$

$= 3t(t^2) - 7t - 4$

12. **Factor.**

$8a^6 + 27$

$= (2a^2 + 3)(4a^4 - 6a^2 + 9)$

Solve each polynomial equation by factoring.

13. $3x^5 + 18x^4 + 27x^3 = 0$

$3x^3(x^2 + 6x + 9) = 0$

$3x^3(x + 3)(x + 3) = 0$

$x = 0, x = 3$

14. **Identify the roots of each equation. State the multiplicity of each root.**

$x^3 - 9x^2 + 27x - 27 = 0$

Possible rational roots are $\pm 1, \pm 3, \pm 9, \pm 27$

By graphing the root is 3. Use synthetic division and end up with

$x^2 - 6x + 9 = 0$

$(x - 3)(x - 3) = 0$

$x = 3, x = 3,$

Since there are three roots of 3, there is a multiplicity of three.

15. **Write the simplest polynomial function with zeros -3, 1/2 and 1.**

$$(x+3)(x-1)\left(x-\frac{1}{2}\right)$$

$$=\left(x-\frac{1}{2}\right)(x^2+2x-3)$$
$$=x^3+\frac{3}{2}x^2-4x+\frac{3}{2}$$

16. **Write the simplest polynomial function with zeros -√2, 3*i* and 4.**

$$(x+\sqrt{2})(x-\sqrt{2})(x-3i)(x+3i)(x-4)$$
$$(x^2-2)(x^2+9)(x-4)$$
$$(x^4+7x^2-18)(x-4)$$
$$x^5-4x^4+7x^3-28x^2-18x+72$$

17. **Solve** $x^3-2x^2-2x-3=0$ **by finding all roots.**

Possible rational roots are $\pm 1, \pm 3,$

By graphing the root is 3. Use synthetic division and end up with

$$x^2+x+1=0$$

Use the quadratic formula to solve .

$$x=\frac{-1\pm\sqrt{1^2-4(1)(1)}}{2(1)} \qquad x=\frac{-1\pm i\sqrt{3}}{2}$$

18. **Solve** $x^4 - 13x^3 + 55x^2 - 91x = 0$ **by finding all roots.**

$x(x^3 - 13x^2 + 55x \ \ - 91) = 0$

So $x = 0$ **is a root**

Possible rational roots are $\pm 1, \pm 7, \pm 13, \pm 91$

By graphing the root is 7. Use synthetic division and end up with

$x^2 - 6x + 13 = 0$

Use the quadratic formula to solve .

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(13)}}{2(1)} \qquad x = \frac{6 \pm \sqrt{-16}}{2} = \frac{6 \pm 4i}{2} = 3 \pm 2i$$