**Solve the following by FACTORING:**

$1) x^{3}+3x^{2}-25x-75=0$ $2) 3x^{3}-16x^{2}-12x=0$

$3) x^{2}+14x+45=0$ $ 4) 9x^{3}-4x=0$

$5) 2x^{5}+6x^{3}=56x$ 6) $5x^{2}=17x-12$

**Determine the Possible Rational Roots using the Rational Root Theorem:**

7) $3x^{4}-2x^{2}+11=0$ 8) $x^{3}-3x^{2}+8x-24=0$

**Solve the following using SYNTHETIC DIVISION & FACTORING:**

$9) 3x^{3}+4x^{2}-5x-2=0$ $10) x^{4}-x^{3}-3x^{2}+x+2=0$

**Solve the following using SYNTHETIC DIVISION & QUADRATIC FORMULA:**

$11) 2x^{3}+5x^{2}+2x-1=0$ $12) x^{3}-9x^{2}+33x-25=0$