04/12/2001 **NAME:**

MATH 1151 QUIZ-11 (15 minutes)

1. (3 points) Solve the equation $x^3 + 2x^2 - 5x - 6 = 0$ in the real number system.

Solution: By using Rational Root Theorem we see that -1,2,-3 are the roots. **Q.E.D.**

2.(3 points) Solve the equation $x^4 = 1$ in the complex number system.

Solution: $x^4 = 1$ is equivalent to saying that $x^4 - 1 = 0$ which is equal to $(x^2 - 1)(x^2 + 1) = (x-1)(x+1)(x^2+1) = 0$. So we simply look at the roots of these and we see that roots are $1, -1, i, -1$.**Q.E.D.**

3.(4 points) Find the complex fourth roots of 1, leave your answers in polar form with argument in radians.

Solution: We express 1 as $1 = 1(\cos 0 + i \sin 0)$ in the complex plane. So we looking at the fifth roots of this number which are equal to $z_k = (\cos \frac{0+2*k*\pi}{5} + i \sin \frac{0+2*k*\pi}{5})$ for $k = 0, 1, 2, 3, 4$. **Q.E.D.**