1. Evaluate the indefinite integral $\int \frac{1}{(x^2+3x+1)^2}dx$. (15%)

2. Find $\lim\limits_{n\to\infty}\sum\limits_{k=1}^{n}\frac{\sqrt{n^2+kn+3k^2}}{n^2}$. (15%)

3. Find the radius of convergence and interval of convergence of the series $\sum\limits_{n=1}^{\infty}(-1)^n\frac{(x+3)^n}{n3^n}$. (20%)

4. Find the derivative of the function F defined by $F(x)=\int_{x}^{x^2+7}\exp(3t^2)dt$. (10%)

5. Evaluate the integral $\int_{-\infty}^{\infty}\exp(-x^2)dx$. (20%)

6. Find the minimum of $f(x)=\cos x+|x|$ on the real line. (20%)