習題集 13

(對應 張旭微積分 積分前篇重點十三：四大積分基本方法之四：部分分式法)

1. Find $\int \frac{x^3-x}{x+2}\,dx$.

2. Find $\int \frac{18x+7}{x+3}dx$.

3. In order to find $\int \sec x\,dx = \int \frac{\cos x}{\cos^2 x}\,dx = \int \frac{\cos x}{1-\sin^2 x}dx$, let us change the variable by $u=\sin x$, then we're able to get the integration $\ln|\sec x+\tan x|$. Try to finish the computation.

4. Find $\int \frac{dx}{e^{2x}-3e^x}$.

5. Find $\int \frac{(2+\sin^2 x+2\cos^2 x)}{(\cos^3 x+\sin^3 x)\cos x}dx$. [Hint: $\int \frac{4+3t^2}{1+t^3}dt$]

6. Find $\int \frac{2x^3}{x^{12}-7x^4-6}dx$.

7. Find $\int \frac{x^4\,dx}{(1-x)^3}$.

8. Find $\int \frac{2x^3\,dx}{(x^2+1)^2}$.

9. Find $\int \frac{x^3+x^2+x+2}{x^4+3x^2+2}dx$.

10. Find $\int \frac{x^5-x^4+4x^3-4x^2+8x-4}{(x^2+2)^3}dx$.