Engineering Mathematics　　Homework 7 Solution

1. $Find: \mathscr{L}^{-1}\{\frac{-2s+6}{s^2+4}\}$

Sol:

$$\mathscr{L}^{-1}\{\frac{-2s+6}{s^2+4}\} = \mathscr{L}^{-1}\{\frac{-2s}{s^2+4}+\frac{6}{s^2+4}\}$$
$$= -2\mathscr{L}^{-1}\{\frac{s}{s^2+4}\}+3\mathscr{L}^{-1}\{\frac{2}{s^2+4}\}$$
$$= -2\cos 2t + 3\sin 2t$$

2. $Find: \mathscr{L}^{-1}\{(\frac{2}{s}-\frac{1}{s^3})^2\}$

Sol:

$$\mathscr{L}^{-1}\{(\frac{2}{s}-\frac{1}{s^3})^2\} = \mathscr{L}^{-1}\{(4\times\frac{1}{s}-\frac{4}{3!}\times\frac{3!}{s^4}+\frac{1}{5!}\times\frac{5!}{s^6})\}$$
$$= 4t-\frac{2}{3}t^3+\frac{1}{120}t^5$$