Numerical methods in chemistry. Exercises 2

Problem 1

Determine the following inverse Laplace transforms by using partial fractions:

(a) $\dfrac{2(2s+7)}{(s+4)(s+2)}$, $s > -2$

(b) $\dfrac{s+9}{s^2-9}$

Problem 2

Verify the initial value theorem [property (9) in the lecture, Theorem 2.6 in the book], for the two functions:

(a) $2 + \cos(t)$

(b) $(4+t)^2$

Problem 3

Verify the final value theorem [property (10) in the lecture, Theorem 2.7 in the book], for the two functions:

(a) $3 + e^{-t}$

(b) $t^3 e^{-t}$

Problem 4

Find the Laplace transform of the function $H(t-a)$.