

電腦在工程數學應用—作業七 (Laplace Transform)

<< Calculus 'LaplaceTransform'

HW1: Find Laplace transform of 1.

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<< Integrate[Exp[-s t], {t,0, Infinity}]
<< LaplaceTransform[1,t,s]
```

```
<< Integrate[Exp[a t] Exp[-s t], {t,0, Infinity}]
<< LaplaceTransform[Exp[a t], t, s]
```

HW2: Find Laplace transform of t .

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<< Integrate[t Exp[-s t], {t,0, Infinity}]
<< LaplaceTransform[t, t, s]
```

HW3: Solve the following ODE by Laplace transform:

$$\ddot{x}(t) + \omega^2 x(t) = \cos(\bar{\omega}t), \text{ if } \bar{\omega} \neq \omega, \text{ or } \bar{\omega} = \omega$$

HW4: Solve the following ODE by Laplace transform:

$$\ddot{x}(t) + \omega^2 x(t) = \sin(\bar{\omega}t), \text{ if } \bar{\omega} \neq \omega, \text{ or } \bar{\omega} = \omega$$

HW5: Find Inverse Laplace Transform of $s/(s^2 + 64)$.

```
<< InverseLaplaceTransform[s/(s^2+64), s, t]
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HW6: Find Inverse Laplace Transform of $s/(s^4 - 64)$.

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<< InverseLaplaceTransform[s/(s^4 - 64), s, t]
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HW7: Find $\mathcal{L}^{-1}\{dF(s)/ds\}$.

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<< InverseLaplaceTransform[D[LaplaceTransform[f[t]],t,s],s],s,t]
```

HW8: Find Laplace transform for Heaviside function $\mathcal{L}\{H(t-a)\}$.

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<< Transform[UnitStep[t-a],t,s]
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HW9: Find the solution by Laplace transform

$$y''(t) - 5y'(t) + 6y(t) = e^{2t}$$

subjected to

$$y(0) = 1, y'(0) = -2$$