

1.

$$\begin{array}{l} \text{[> with(inttrans) :} \\ \text{[> laplace(sin(a \cdot t), t, s)} \\ \text{[} \end{array} \quad \frac{a}{a^2 + s^2} \quad (1)$$

$$\begin{array}{l} \text{[> laplace(cos(5 \cdot t), t, s)} \\ \text{[} \end{array} \quad \frac{s}{s^2 + 25} \quad (2)$$

$$\begin{array}{l} \text{[> laplace(exp(a \cdot t), t, s)} \\ \text{[} \end{array} \quad \frac{1}{s - a} \quad (3)$$

$$\begin{array}{l} \text{[> laplace(t^3 \cdot exp(3 \cdot t), t, s)} \\ \text{[} \end{array} \quad \frac{6}{(s - 3)^4} \quad (4)$$

2.

$$\begin{array}{l} \text{[> h := (7 \cdot t - 2)^5} \\ \text{[} \end{array} \quad h := (7 t - 2)^5 \quad (5)$$

$$\begin{array}{l} \text{[> h_prime := diff(h, t)} \\ \text{[} \end{array} \quad h\_prime := 35 (7 t - 2)^4 \quad (6)$$

$$\begin{array}{l} \text{[> h_doubleprime := diff(h_prime, t)} \\ \text{[} \end{array} \quad h\_doubleprime := 980 (7 t - 2)^3 \quad (7)$$

$$\begin{array}{l} \text{[> laplace(h, t, s)} \\ \text{[} \end{array} \quad - \frac{8 (4 s^5 - 70 s^4 + 980 s^3 - 10290 s^2 + 72030 s - 252105)}{s^6} \quad (8)$$

$$\begin{array}{l} \text{[> laplace(h_prime, t, s)} \\ \text{[} \end{array} \quad \frac{280 (2 s^4 - 28 s^3 + 294 s^2 - 2058 s + 7203)}{s^5} \quad (9)$$

$$\left[ \begin{array}{l} \text{> } \text{laplace}(h\_doubleprime, t, s) \\ - \frac{1960 (4 s^3 - 42 s^2 + 294 s - 1029)}{s^4} \end{array} \right. \quad (10)$$

3.

$$\left[ \begin{array}{l} \text{> } \text{laplace}(\exp(a \cdot t) \cdot \sin(b \cdot t), t, s) \\ \frac{b}{(s - a)^2 + b^2} \end{array} \right. \quad (11)$$

4.

$$\left[ \begin{array}{l} \text{> } \text{laplace}(\exp(-3 \cdot t) \cdot (2 \cdot \cos(5 \cdot t) - 3 \cdot \sin(5 \cdot t)), t, s) \\ \frac{-9 + 2 s}{(s + 3)^2 + 25} \end{array} \right. \quad (12)$$

5.

$$\left[ \begin{array}{l} \text{> } \text{laplace}(t \cdot \exp(-4 \cdot t) \cdot \sin(3 \cdot t), t, s) \\ \frac{6 (s + 4)}{((s + 4)^2 + 9)^2} \end{array} \right. \quad (13)$$