



(C1) 'integrate(sinh(a*x)*f(t-x),x,0,t) + b*f(t) = t^2;

(D1)
$$\int_0^t f(t-x) \sinh(ax) dx + bf(t) = t^2$$

(C2) laplace(%,t,s);

(D2)
$$b\mathcal{L}(f(t),t,s) + \frac{a\mathcal{L}(f(t),t,s)}{s^2 - a^2} = \frac{2}{s^3}$$

(C3) linsolve(%, ['laplace(f(t), t, s)]);

(D3)
$$\left[\mathcal{L}(f(t),t,s) = \frac{2s^2 - 2a^2}{bs^5 + (a - a^2b)s^3} \right]$$

(C4) ilt(%[1], s, t);

(*) Is $ab(ab-1)$ positive, negative, or zero? pos;

(D4)
$$f(t) = -\frac{2 \cosh\left(\frac{\sqrt{ab(ab-1)}t}{b}\right)}{a^3b^2 - 2a^2b + a} + \frac{at^2}{ab-1} + \frac{2}{a^3b^2 - 2a^2b + a}$$

(C5) expand((x + y + z)^6);

(D5)
$$\begin{aligned} & z^6 + 6yz^5 + 6xz^5 + 15y^2z^4 + 30xyz^4 + 15x^2z^4 \\ & + 20y^3z^3 + 60xy^2z^3 + 60x^2yz^3 + 20x^3z^3 + 15y^4z^2 \\ & + 60xy^3z^2 + 90x^2y^2z^2 + 60x^3yz^2 + 15x^4z^2 + 6y^5z \\ & + 30xy^4z + 60x^2y^3z + 60x^3y^2z + 30x^4yz + 6x^5z \\ & + y^6 + 6xy^5 + 15x^2y^4 + 20x^3y^3 + 15x^4y^2 + 6x^5y + x^6 \end{aligned}$$

(C6) h[i,j]:=1/(1 + j - 1);

(D6)
$$h_{i,j} := \frac{1}{1 + j - 1}$$

(C7) genmatrix(h,2,2);

(D7)
$$\begin{pmatrix} 1 & \frac{1}{2} \\ 1 & \frac{1}{2} \end{pmatrix}$$

(C8) 'diff(g(x), x, 2) = 'diff(g(x), x) - cos(x);

(D8)
$$\frac{d^2}{dx^2} g(x) = \frac{d}{dx} g(x) - \cos x$$

(C9)