>

ECUACIONES DIFERENCIALES CON MAPLE
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LEY DE ENFRIAMIENTO DE NEWTON

condiciones iniciales

> $Ti := 100; Tm := 10$

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$$Tm := 10 \tag{1}$$

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Ecuación diferencial

> $T' = k \cdot (T - Tm)$

$$\frac{d}{dx} T(x) = k \, (T(x) - 10) \tag{2}$$

> $dsolve(\, (2), \{\, T(x) \,\} \,)$

$$T(x) = 10 + e^{kx} \_C1 \tag{3}$$

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Datos del problema

> $t := 60 \,; T\_ := 75$

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$$T\_ := 75 \tag{4}$$

> $solve(\, \{eval(10 + e^{kx} \_C1, x = 0) = Ti\}, \{\_C1\})$

$$\{\_C1 = 90\} \tag{5}$$

>

> $solve(\, \{eval(10 + e^{kx} \cdot 90, x = t) = T\_\}, \{k\})$

$$\left\{ k = \frac{1}{60} \, \ln\left(\frac{13}{18} \right) \right\} \tag{6}$$

> $solve\left(\left\{ 50 = 10 + e^{\frac{1}{60} \ln\left(\frac{13}{18} \right) \cdot x} \cdot 90 \right\}, \{x\} \right)$

$$\left\{ x = \frac{60 \ln\left(\frac{4}{9} \right)}{\ln\left(\frac{13}{18} \right)} \right\} \tag{7}$$

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