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> restart
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$$gravedad := \frac{981}{100}; Hooke := \frac{\left(\frac{1825}{100}\right)}{\left(\frac{5}{10}\right)}; Peso_{alumnio} := \frac{23}{1000};$$

$$gravedad := \frac{981}{100}$$

$$Hooke := \frac{73}{2}$$

$$Peso_{alumnio} := \frac{23}{1000} \quad (1)$$

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> Ecuacion_dinamica := diff(s(t), t$2) * (Peso_alumnio / gravedad) = -Hooke * s(t);
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$$Ecuacion_{dinamica} := \frac{23}{9810} \frac{d^2}{dt^2} s(t) = -\frac{73}{2} s(t) \quad (2)$$

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> Condiciones := s(0) = -4964/10000, D(s)(0) = 0;
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$$Condiciones := s(0) = -\frac{1241}{2500}, D(s)(0) = 0 \quad (3)$$

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> Solucion := dsolve({Ecuacion_dinamica, Condiciones});
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$$Solucion := s(t) = -\frac{1241}{2500} \cos\left(\frac{3}{23} \sqrt{915055} t\right) \quad (4)$$

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> tiempo_empuje := solve(rhs(Solucion) = 0, t); evalf(%);
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$$tiempo_{empuje} := \frac{1}{238710} \pi \sqrt{915055}$$

$$0.01258933700 \quad (5)$$

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> Velocidad_inicial := subs(t = tiempo_empuje, rhs(diff(Solucion, t))); evalf(%); evalf(%%) * 36 / 10;
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$$Velocidad_{inicial} := \frac{3723}{57500} \sin\left(\frac{1}{2} \pi\right) \sqrt{915055}$$

$$61.93680388$$

$$222.9724940 \quad (6)$$

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