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Theoretical Question 1: The Shockley-James Paradox

ANSWER FORM

a. $M_{12} =$

b. $\varepsilon_2 =$

c. $E =$

d. $\Delta p =$

e. $p =$

f. $p_{hid} =$

g. Re-expressed results:

$\Delta p =$

$p_{hid} =$

h. A: True / False

B: True / False

C: True / False

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Theoretical Question 2: Creaking Door

ANSWER FORM

a1. $T_0 =$

$A =$

a2. Graph of the spring's elongation $x(t)$:

b. Graph of the velocity $v(t)$ with respect to the floor:

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c. $\bar{x} =$

d. $T =$

e. $u_c =$

f. $\kappa =$

g. Expression for Ω :

Value of Ω :

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Theoretical Question 3: Birthday Balloon

ANSWER FORM

a. $\sigma_L/\sigma_t =$

b. Expression for $P(V)$ from Hooke's law:

$P(V) =$

Graph of $P - P_0$ as a function of V for Hooke's law:

Maximal inflation pressure from Hooke's law:

$P_{max} =$

c. Graph of $P - P_0$ as a function of V for realistic rubber and uniform inflation:

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Value of $P - P_0$ at $r = 0.5$ cm:

Value of $P - P_0$ at $r = 2.5$ cm:

d. $P_c =$

 $V_1 =$

 $V_2 =$

e. Graph of $P - P_0$ as a function of V taking the split into account:

f. $L_{thin}(V) =$

g. $\Delta W / \Delta L_{thin} =$