Theoretical Competition

3 May 2011

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