## **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:

 $V_2 =$ 

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



 $\mathbf{f.} \quad L_{thin}(V) =$ 

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