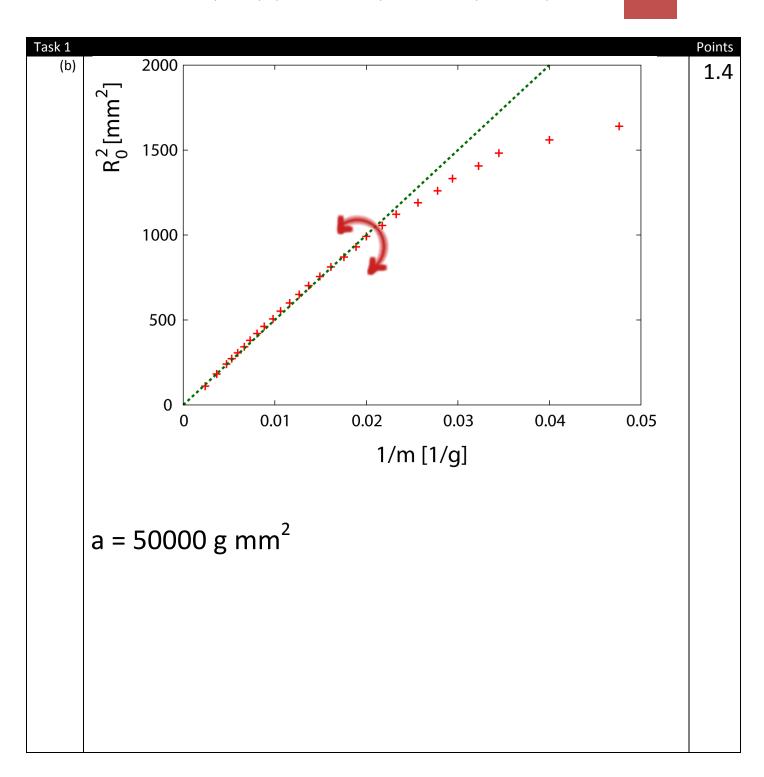
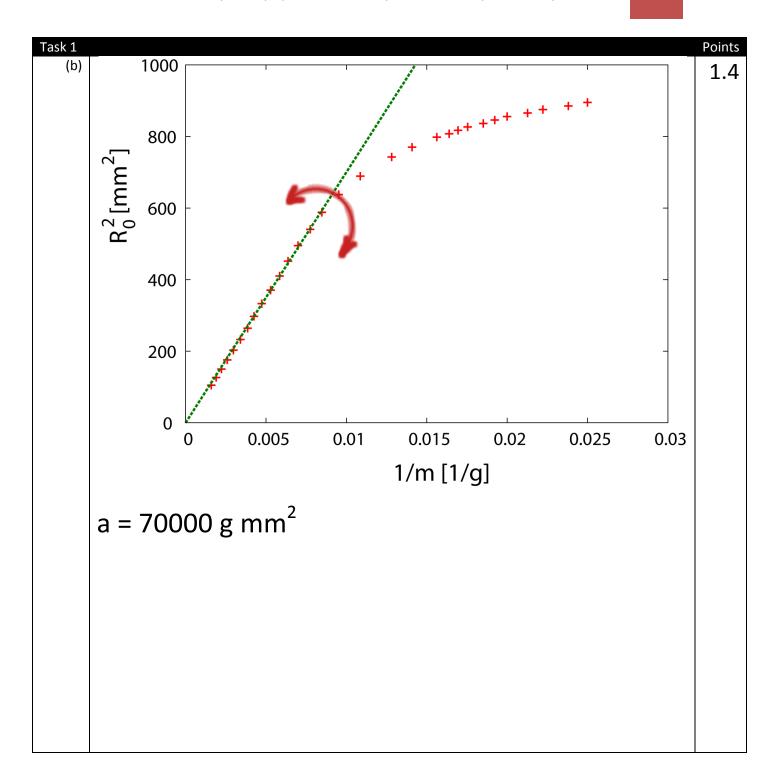
Solution: Exp. problem 1

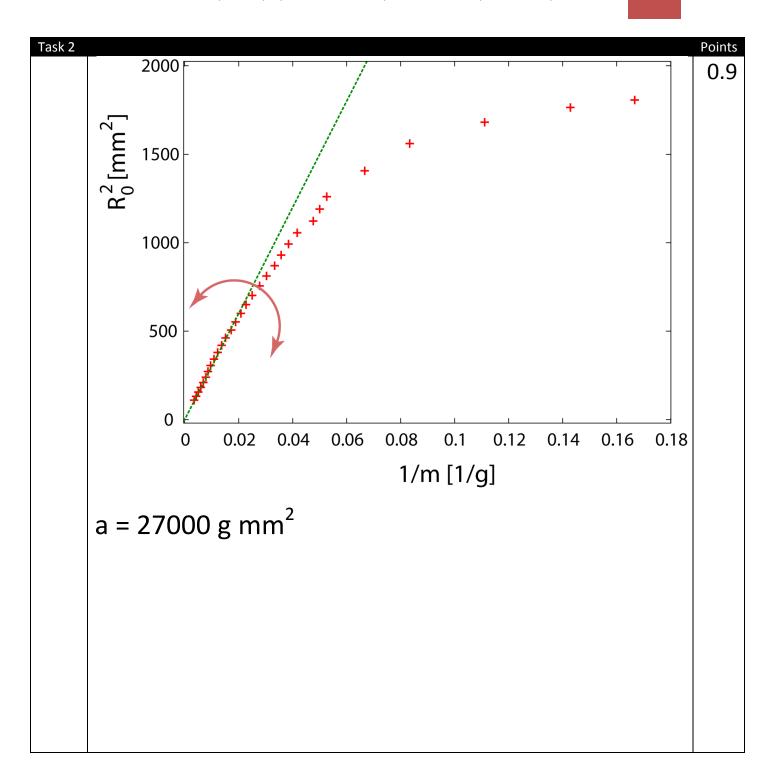
Task 1			Points
(a)	m[g]	R ₀ [mm]	0.95
	21	40.5	0.55
	25	39.5	
	29	38.5	
	31	37.5	
	34	36.5	
	36	35.5	
	39	34.5	
	43	33.5	
	46	32.5	
	50	31.5	
	53	30.5	
	57	29.5	
	62	28.5	
	67	27.5	
	73	26.5	
	79	25.5	
	86	24.5	
	94	23.5	
	102	22.5	
	113	21.5	
	124	20.5	
	137	19.5	
	150	18.5	
	168	17.5	
	189	16.5	
	212	15.5	
	274	13.5	
	417	10.5	

m[g]	R ₀ [mm]	
40	29.9	1
42	29.8	1
45	29.6	1
47	29.4	1
50	29.3	1
52	29.1	1
54	28.9	1
57	28.8	1
59	28.6	1
61	28.4	1
64	28.3	1
71	27.8	1
78	27.3	1
92	26.3	1
105	25.3	1
118	24.3	1
129	23.3	1
143	22.3	1
157	21.3	1
171	20.3	1
189	19.3	1
211	18.3	1
235	17.3	1
259	16.3	1
293	15.3	1
336	14.3	1
386	13.3	1
449	12.3	1





$\kappa = \frac{2ag}{\pi l} = 1.5 \text{ mJ} \qquad 0.5$ $\kappa = \frac{2ag}{\pi l} = 1.5 \text{ mJ} \qquad 0.5$ $\frac{R_0}{R_c} \le 0.70 \qquad \frac{R_0}{R_c} \le 0.77 \qquad 0.5$ $\frac{\text{m[g]}}{6} \qquad \frac{\text{R_0[mn]}}{42.5} \qquad 0.9$ $\frac{6}{7} \qquad 42. \qquad 9 \qquad 41. \qquad 1.2$ $12 \qquad 39.5 \qquad 37.5$ $19 \qquad 35.5 \qquad 37.5$ $19 \qquad 35.5 \qquad 20 \qquad 34.5$ $21 \qquad 33.5 \qquad 22.1$ $24 \qquad 32.5 \qquad 30.5$ $26 \qquad 31.5 \qquad 30.5$ $28 \qquad 30.5 \qquad 30.5$ $28 \qquad 30.5 \qquad 30.5$ $30 \qquad 29.5 \qquad 33.3$ $28.5 \qquad 30.5$ $30 \qquad 29.5 \qquad 33.3$ $28.5 \qquad 30.5$ $36 \qquad 27.5 \qquad 40$ $40 \qquad 26.5 \qquad 44$ $40 \qquad 26.5 \qquad 44$ $40 \qquad 26.5 \qquad 5.5$ $440 \qquad 26.5 \qquad 5.5$ $48 \qquad 22.5 \qquad 5.5$ $66 \qquad 21.5 \qquad 7.7$ $73 \qquad 20.5 \qquad 5.5$ $82 \qquad 19.5 \qquad 5.5$ $92 \qquad 18.5 \qquad 10.04$ $1104 \qquad 17.5 \qquad 15.5$ $104 \qquad 17.5 \qquad 15.5$ $104 \qquad 17.5 \qquad 15.5$ $104 \qquad 17.5 \qquad 15.5$ $105 \qquad 127 \qquad 15.5$ $106 \qquad 13.5 \qquad 14.5$			D : .
$\kappa = \frac{2ag}{\pi l} = 1.5 \text{ mJ}$ $\kappa = \frac{2ag}{\pi l} = 1.5 \text{ mJ}$ $\frac{R_0}{R_c} \le 0.70$ $\frac{R_0}{R_c} \le 0.77$ $\frac{R_0}{R_0} \le 0.77$ $\frac{R_0}{R$	Ī		
$\frac{R_0}{R_c} \leq 0.70 \qquad \frac{R_0}{R_c} \leq 0.77 \qquad 0.5$ Task 2 Points $\frac{\mathbf{m[g]}}{6} \qquad \frac{\mathbf{R_0[mm]}}{42.5} \qquad 0.9$ $\frac{\mathbf{n[g]}}{12} \qquad \frac{\mathbf{R_0[mm]}}{39.5} \qquad 0.9$ $\frac{12}{12} \qquad 39.5 \qquad 0.9$ $\frac{15}{15} \qquad 37.5 \qquad 0.9$ $\frac{19}{20} \qquad 34.5 \qquad 0.9$ $20 \qquad 34.5 \qquad 0.9$ $21 \qquad 33.5 \qquad 0.9$ $221 \qquad 33.5 \qquad 0.9$ $24 \qquad 32.5 \qquad 0.9$ $26 \qquad 31.5 \qquad 0.9$ $28 \qquad 30.5 \qquad 0.9$ $30 \qquad 29.5 \qquad 0.9$ $33 \qquad 0.9.5 \qquad 0.9$ $33 \qquad 0.9.5 \qquad 0.9$ $33 \qquad 0.5 \qquad 0.9$ $36 \qquad 0.7.5 \qquad 0.9$ $40 \qquad 0.6.5 \qquad 0.9$ $44 \qquad 0.6.5 \qquad 0.9$ $44 \qquad 0.9.5 \qquad 0.9$ $48 \qquad 0.9.5 \qquad 0.9$ $41 \qquad 0.9$	(0)		0.5
$\frac{R_0}{R_c} \leq 0.700 \qquad \frac{R_0}{R_c} \leq 0.777 \qquad 0.5$ $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2ag		
$\frac{R_0}{R_c} \leq 0.700 \qquad \frac{R_0}{R_c} \leq 0.777 \qquad 0.5$ $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$K = \frac{1}{2} = 1.5 \text{ mJ}$		
$\frac{R_0}{R_c} \leq 0.70 \qquad \frac{R_0}{R_c} \leq 0.77 \qquad 0.5$ $\frac{\text{m[g]}}{6} \qquad \frac{\text{R_0[mm]}}{42.5} \qquad 0.9$ $\frac{12}{39.5} \qquad 37.5 \qquad 15 \qquad 37.5 \qquad 19 \qquad 35.5 \qquad 20 \qquad 34.5 \qquad 21 \qquad 33.5 \qquad 221 \qquad 33.5 \qquad 224 \qquad 32.5 \qquad 26 \qquad 31.5 \qquad 28 \qquad 30.5 \qquad 30 \qquad 29.5 \qquad 33 \qquad 28.5 \qquad 36 \qquad 27.5 \qquad 40 \qquad 26.5 \qquad 44 \qquad 25.5 \qquad 48 \qquad 24.5 \qquad 35 \qquad 23.5 \qquad 58 \qquad 22.5 \qquad 66 \qquad 21.5 \qquad 73 \qquad 20.5 \qquad 82 \qquad 19.5 \qquad 92 \qquad 18.5 \qquad 104 \qquad 17.5 \qquad 116 \qquad 16.5 \qquad 127 \qquad 15.5 \qquad 145 \qquad 14.5$	7.0		
$\frac{R_0}{R_c} \leq 0.700 \qquad \frac{R_0}{R_c} \leq 0.777 \qquad 0.5$ $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2ag		0.5
$\frac{R_0}{R_c} \leq 0.70 \qquad \frac{R_0}{R_c} \leq 0.77 \qquad 0.5$ $\frac{\text{m[g]}}{6} \qquad \frac{\text{R_0[mm]}}{42.5} \qquad 0.9$ $\frac{12}{39.5} \qquad 37.5 \qquad 15 \qquad 37.5 \qquad 19 \qquad 35.5 \qquad 20 \qquad 34.5 \qquad 21 \qquad 33.5 \qquad 221 \qquad 33.5 \qquad 224 \qquad 32.5 \qquad 26 \qquad 31.5 \qquad 28 \qquad 30.5 \qquad 30 \qquad 29.5 \qquad 33 \qquad 28.5 \qquad 36 \qquad 27.5 \qquad 40 \qquad 26.5 \qquad 44 \qquad 25.5 \qquad 48 \qquad 24.5 \qquad 35 \qquad 23.5 \qquad 58 \qquad 22.5 \qquad 66 \qquad 21.5 \qquad 73 \qquad 20.5 \qquad 82 \qquad 19.5 \qquad 92 \qquad 18.5 \qquad 104 \qquad 17.5 \qquad 116 \qquad 16.5 \qquad 127 \qquad 15.5 \qquad 145 \qquad 14.5$	$\kappa = \frac{6}{1} = 1.5 \text{ mJ}$		
$\frac{R_0}{R_c} \leq 0.70 \qquad \frac{R_0}{R_c} \leq 0.77 \qquad 0.5$ $\frac{\text{m[g]}}{6} \qquad \frac{\text{R_0[mm]}}{42.5} \qquad 0.9$ $\frac{12}{39.5} \qquad 37.5 \qquad 15 \qquad 37.5 \qquad 19 \qquad 35.5 \qquad 20 \qquad 34.5 \qquad 21 \qquad 33.5 \qquad 221 \qquad 33.5 \qquad 224 \qquad 32.5 \qquad 26 \qquad 31.5 \qquad 28 \qquad 30.5 \qquad 30 \qquad 29.5 \qquad 33 \qquad 28.5 \qquad 36 \qquad 27.5 \qquad 40 \qquad 26.5 \qquad 44 \qquad 25.5 \qquad 48 \qquad 24.5 \qquad 35 \qquad 23.5 \qquad 58 \qquad 22.5 \qquad 66 \qquad 21.5 \qquad 73 \qquad 20.5 \qquad 82 \qquad 19.5 \qquad 92 \qquad 18.5 \qquad 104 \qquad 17.5 \qquad 116 \qquad 16.5 \qquad 127 \qquad 15.5 \qquad 145 \qquad 14.5$	π		
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	D	D	
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	$\frac{\kappa_0}{\kappa_0} < 2$	$\frac{\mathbf{\Lambda}_0}{\mathbf{\Lambda}_0} < \mathbf{\Lambda}_0$	0.5
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	R = 0.70	$R^{-0.77}$	0.5
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5		$\mathcal{L}_{\mathcal{C}}$	
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	Task 2		
m[g] R ₀ [mm] 6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5			0.9
6 42.5 7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	m[g]	R ₀ [mm]	
7 42. 9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5			
9 41. 12 39.5 15 37.5 19 35.5 20 34.5 21 33.5 24 32.5 26 31.5 28 30.5 30 29.5 33 28.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5			
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28 30.5 30 29.5 33 28.5 36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5			
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36 27.5 40 26.5 44 25.5 48 24.5 53 23.5 58 22.5 66 21.5 73 20.5 82 19.5 92 18.5 104 17.5 116 16.5 127 15.5 145 14.5			
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92 18.5 104 17.5 116 16.5 127 15.5 145 14.5	82	19.5	
104 17.5 116 16.5 127 15.5 145 14.5	92		
127 15.5 145 14.5	104	17.5	
145 14.5	116	16.5	
	127	15.5	
168 13.5	145	14.5	
	168	13.5	



Task 2		Points
	$\kappa = 0.8 \text{ mJ}$	1.0
Task 3		Points
	Young modulus of the blue foil:	0.6
	Y=2.0 GPa Y=2.0 GPa	
	Young modulus of the colorless foil:	0.4
	Y=2.5 GPa	
Total:		10