

Solution: Exp. problem 1

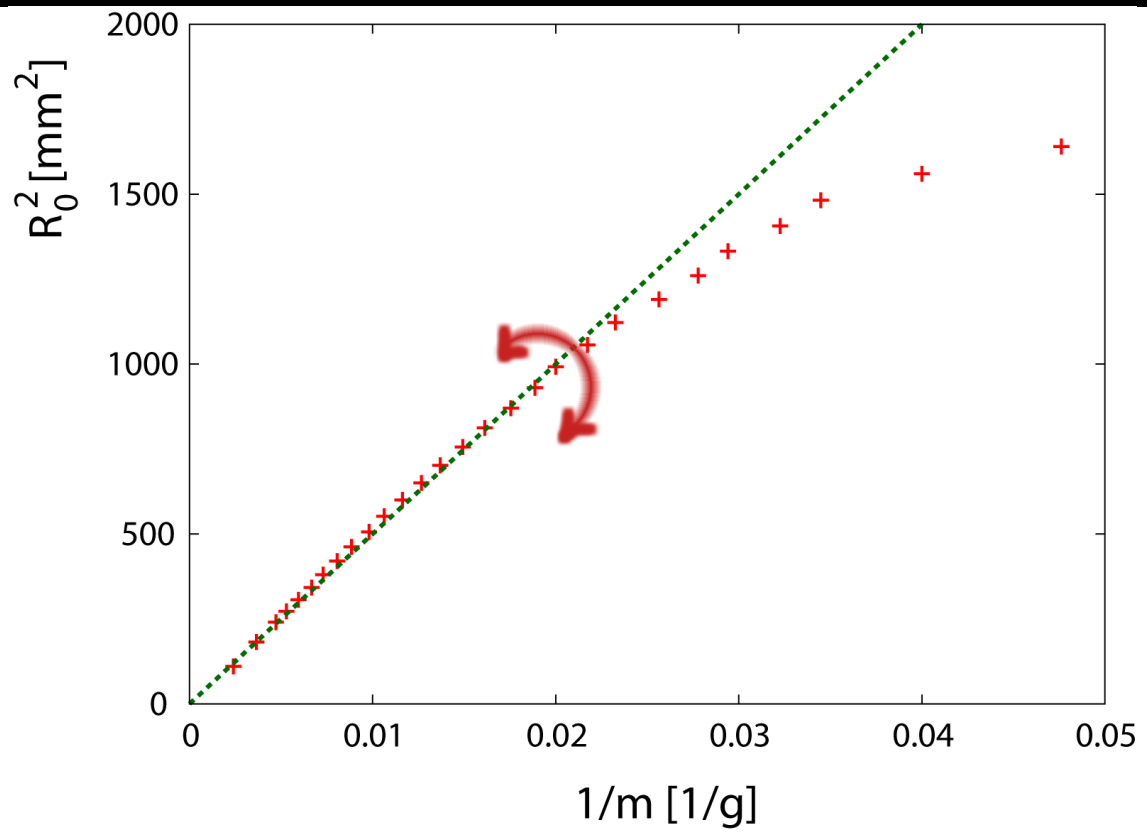
Task 1			Points
(a)	m[g]	R₀[mm]	0.95
	21	40.5	
	25	39.5	
	29	38.5	
	31	37.5	
	34	36.5	
	36	35.5	
	39	34.5	
	43	33.5	
	46	32.5	
	50	31.5	
	53	30.5	
	57	29.5	
	62	28.5	
	67	27.5	
	73	26.5	
	79	25.5	
	86	24.5	
	94	23.5	
	102	22.5	
	113	21.5	
	124	20.5	
	137	19.5	
	150	18.5	
	168	17.5	
	189	16.5	
	212	15.5	
	274	13.5	
	417	10.5	

Task 1		Points																																																										
(a)	<table border="1"><thead><tr><th>m[g]</th><th>R₀[mm]</th></tr></thead><tbody><tr><td>40</td><td>29.9</td></tr><tr><td>42</td><td>29.8</td></tr><tr><td>45</td><td>29.6</td></tr><tr><td>47</td><td>29.4</td></tr><tr><td>50</td><td>29.3</td></tr><tr><td>52</td><td>29.1</td></tr><tr><td>54</td><td>28.9</td></tr><tr><td>57</td><td>28.8</td></tr><tr><td>59</td><td>28.6</td></tr><tr><td>61</td><td>28.4</td></tr><tr><td>64</td><td>28.3</td></tr><tr><td>71</td><td>27.8</td></tr><tr><td>78</td><td>27.3</td></tr><tr><td>92</td><td>26.3</td></tr><tr><td>105</td><td>25.3</td></tr><tr><td>118</td><td>24.3</td></tr><tr><td>129</td><td>23.3</td></tr><tr><td>143</td><td>22.3</td></tr><tr><td>157</td><td>21.3</td></tr><tr><td>171</td><td>20.3</td></tr><tr><td>189</td><td>19.3</td></tr><tr><td>211</td><td>18.3</td></tr><tr><td>235</td><td>17.3</td></tr><tr><td>259</td><td>16.3</td></tr><tr><td>293</td><td>15.3</td></tr><tr><td>336</td><td>14.3</td></tr><tr><td>386</td><td>13.3</td></tr><tr><td>449</td><td>12.3</td></tr></tbody></table>	m[g]	R₀[mm]	40	29.9	42	29.8	45	29.6	47	29.4	50	29.3	52	29.1	54	28.9	57	28.8	59	28.6	61	28.4	64	28.3	71	27.8	78	27.3	92	26.3	105	25.3	118	24.3	129	23.3	143	22.3	157	21.3	171	20.3	189	19.3	211	18.3	235	17.3	259	16.3	293	15.3	336	14.3	386	13.3	449	12.3	0.95
m[g]	R₀[mm]																																																											
40	29.9																																																											
42	29.8																																																											
45	29.6																																																											
47	29.4																																																											
50	29.3																																																											
52	29.1																																																											
54	28.9																																																											
57	28.8																																																											
59	28.6																																																											
61	28.4																																																											
64	28.3																																																											
71	27.8																																																											
78	27.3																																																											
92	26.3																																																											
105	25.3																																																											
118	24.3																																																											
129	23.3																																																											
143	22.3																																																											
157	21.3																																																											
171	20.3																																																											
189	19.3																																																											
211	18.3																																																											
235	17.3																																																											
259	16.3																																																											
293	15.3																																																											
336	14.3																																																											
386	13.3																																																											
449	12.3																																																											

Task 1

Points

(b)



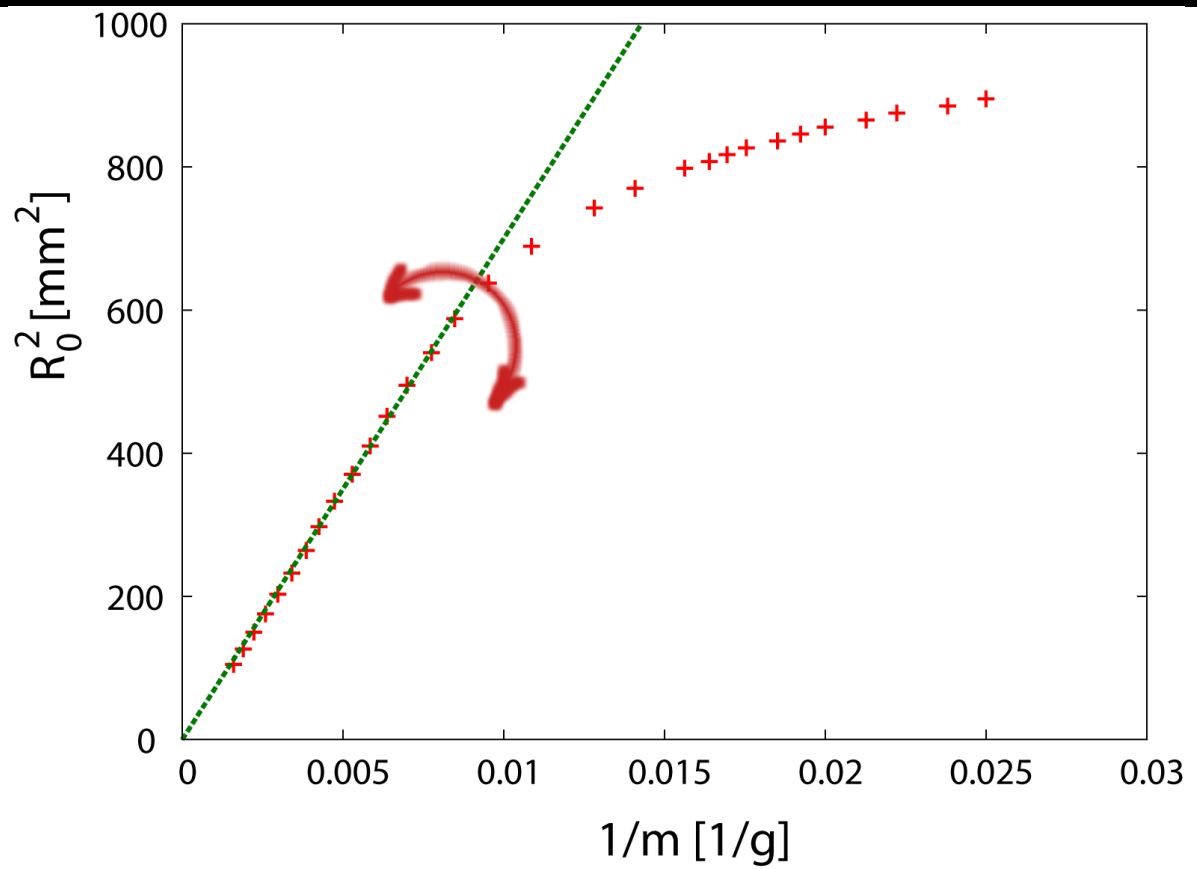
$$a = 50000 \text{ g mm}^2$$

1.4

Task 1

Points

(b)



$$a = 70000 \text{ g mm}^2$$

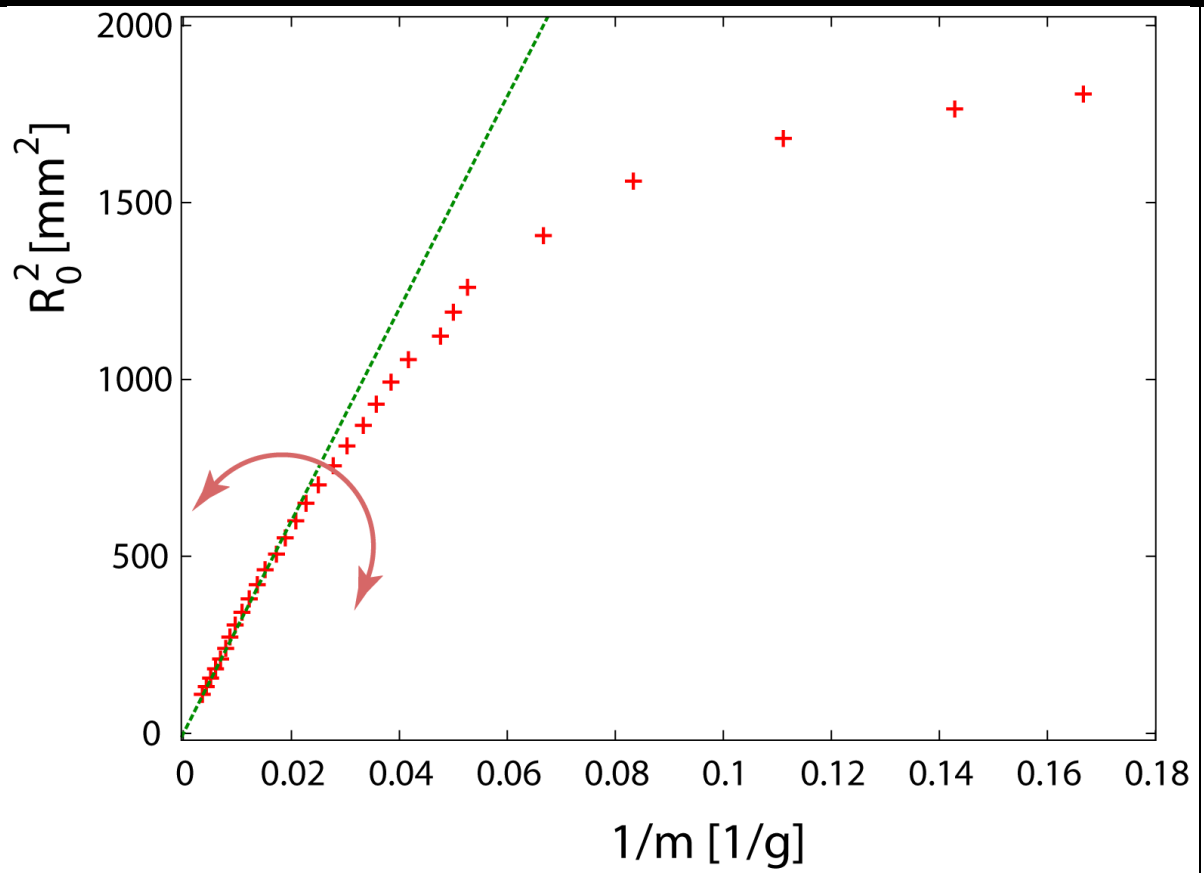
1.4

Task 1		Points																																																										
(b)	$\kappa = \frac{2ag}{\pi d} = 1.5 \text{ mJ}$	0.5																																																										
	$\kappa = \frac{2ag}{\pi d} = 1.5 \text{ mJ}$	0.5																																																										
	$\frac{R_0}{R_c} \leq 0.70$ $\frac{R_0}{R_c} \leq 0.77$	0.5																																																										
Task 2		Points																																																										
	<table border="1"> <thead> <tr> <th>m[g]</th> <th>R₀[mm]</th> </tr> </thead> <tbody> <tr><td>6</td><td>42.5</td></tr> <tr><td>7</td><td>42.</td></tr> <tr><td>9</td><td>41.</td></tr> <tr><td>12</td><td>39.5</td></tr> <tr><td>15</td><td>37.5</td></tr> <tr><td>19</td><td>35.5</td></tr> <tr><td>20</td><td>34.5</td></tr> <tr><td>21</td><td>33.5</td></tr> <tr><td>24</td><td>32.5</td></tr> <tr><td>26</td><td>31.5</td></tr> <tr><td>28</td><td>30.5</td></tr> <tr><td>30</td><td>29.5</td></tr> <tr><td>33</td><td>28.5</td></tr> <tr><td>36</td><td>27.5</td></tr> <tr><td>40</td><td>26.5</td></tr> <tr><td>44</td><td>25.5</td></tr> <tr><td>48</td><td>24.5</td></tr> <tr><td>53</td><td>23.5</td></tr> <tr><td>58</td><td>22.5</td></tr> <tr><td>66</td><td>21.5</td></tr> <tr><td>73</td><td>20.5</td></tr> <tr><td>82</td><td>19.5</td></tr> <tr><td>92</td><td>18.5</td></tr> <tr><td>104</td><td>17.5</td></tr> <tr><td>116</td><td>16.5</td></tr> <tr><td>127</td><td>15.5</td></tr> <tr><td>145</td><td>14.5</td></tr> <tr><td>168</td><td>13.5</td></tr> </tbody> </table>	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	168	13.5	0.9
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																																																											
168	13.5																																																											

Task 2

Points

0.9



$$a = 27000 \text{ g mm}^2$$

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