51. We solve for m using the formula $r = \sqrt{(2m+1)R\lambda/2}$ obtained in problem 49 and find $m = r^2/R\lambda - 1/2$. Now, when m is changed to $m + 20$, r becomes r', so $m + 20 = r'^2/R\lambda - 1/2$. Taking the difference between the two equations above, we eliminate m and find

$$R = \frac{r'^2 - r^2}{20\lambda} = \frac{(0.368\,\text{cm})^2 - (0.162\,\text{cm})^2}{20(546 \times 10^{-7}\,\text{cm})} = 100\ \text{cm}\ .$$