Problem 2

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Make a new figure with 1 column and 1 row, then define 'radius' as a vector of length 10,000. These small increments will make the plot look like a smooth curve instead of a choppy set of lines. By now all of your plots should be properly labelled. Full points are only for well made plots. Have you had this error yet? 'Error in plot.new() : figure margins too large' If so you need to make the plot window larger in RStudio.

Question 2a, (4 points):

Provide a .pdf of this new plot.

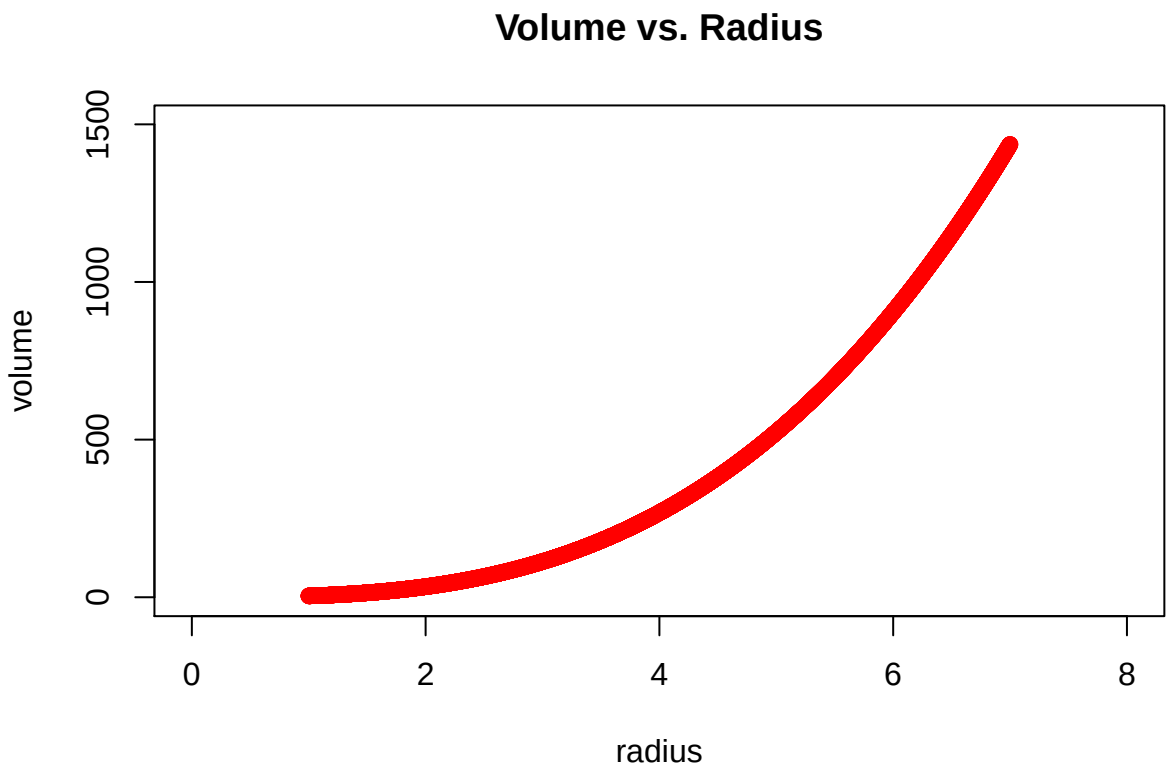
Question 2b, (1 point):

provide the R code you used to make it.

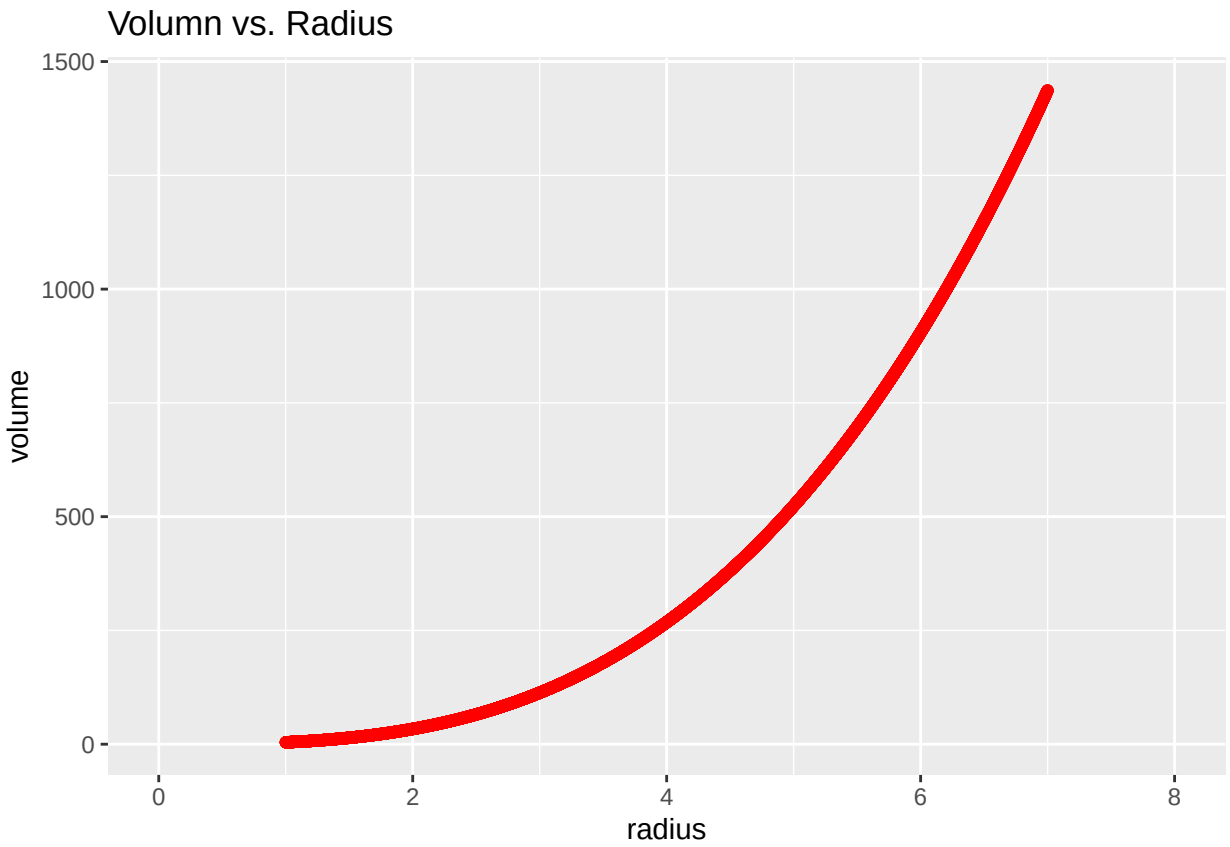
Question 2c, (1 bonus point):

make a version of this plot using the R package ggplot2 (https://cran.r-project.org/web/packages/ggplot2/ggplot2.pdf) and provide a .pdf of the plot. You may need to read about installing the ggplot2 package using the command install.packages.

```
par(mfrow=c(1,1))
radius = seq(from = 1, to = 7, length = 10000)
volume = 4/3*pi*radius^3
plot(radius,volume,main="Volume vs. Radius",
     xlab="radius",
     ylab="volume",
     xlim=c(0,8),
     ylim=c(0,1500),
     col = 'red')
```




```
# Question 2c
library(ggplot2)
df = data.frame(radius,volume)
ggplot(data = df, aes(x = radius, y = volume)) +
  geom_point(color = "red") +
  ggtitle("Volumn vs. Radius") +
  xlim(0,8)
```


Volumn vs. Radius
1500
1000
500
0
volume
0
2
4
6
8
radius