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Cylindrical contact lens

This script calculates the volume of a contact lens(cylindrical)

```
% end section
```

Author Information

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Initialization

```
load("contactLensData");

% Dx = x2-x1, x3-x2, ... cause x is unevenly
% spaced
Dx = x(2:1:end) - x(1:1:end-1);

% Trapezoid coefficients
c = 2 * ones(1,length(x));
c(1) = 1;
c(end) = 1;

ReimannLeft = x(1:1:end-1);
ReimannRight = x(2:1:end);

yBackLeft = yBack(1:1:end-1);
yBackRight = yBack(2:1:end);

yFrontLeft = yFront(1:1:end-1);
yFrontRight = yFront(2:1:end);
```

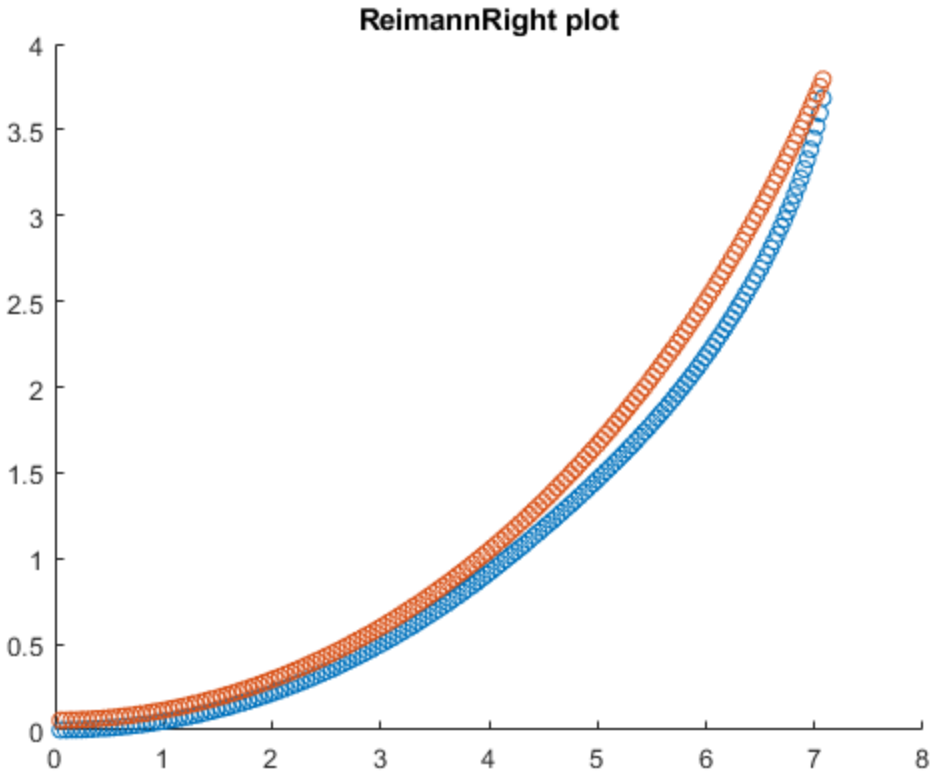
Calculation of Volume

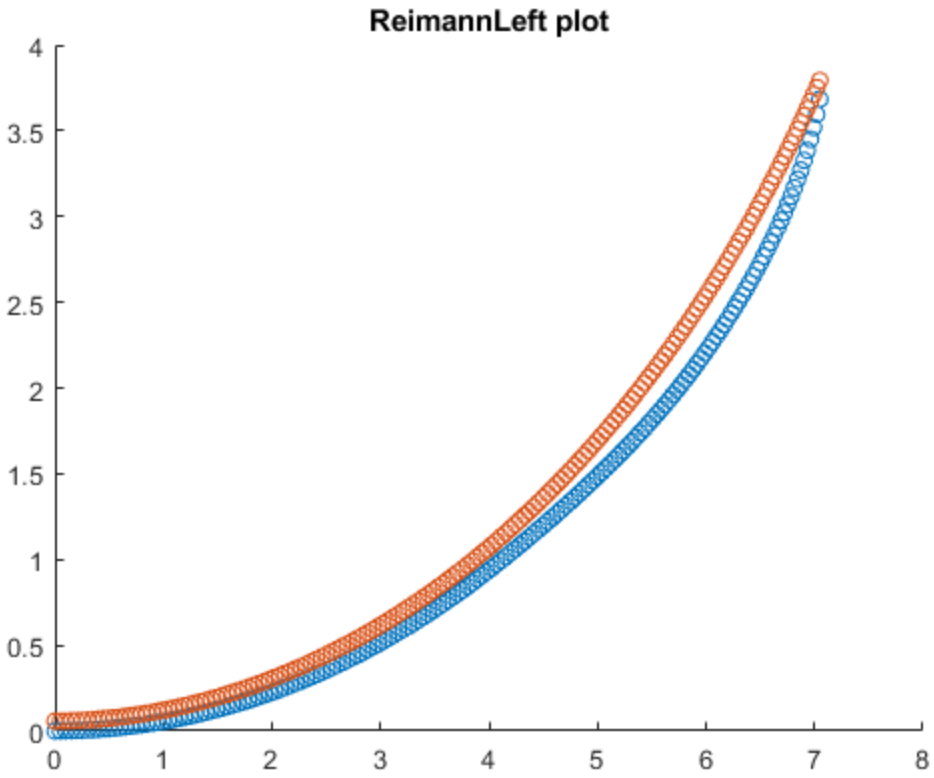
```
LeftReimannSum = Dx.*ReimannLeft.*yBackLeft;
RightReimannSum = Dx.*ReimannRight.*yBackRight;
Volume1 = 0.5*2*pi*(sum(LeftReimannSum)+sum(RightReimannSum));

LeftReimannSum1 = Dx.*ReimannLeft.*yFrontLeft;
```

```
RightReimannSum1 = Dx.*ReimannRight.*yFrontRight;
Volume2 = 0.5*pi*(sum(LeftReimannSum1) + sum(RightReimannSum1));

% scatterplot
figure;
s1 = scatter(ReimannRight, yFrontLeft);
hold on;
s2 = scatter(ReimannRight, yBackRight);
title("ReimannRight plot");
figure;
s3 = scatter(ReimannLeft, yFrontLeft);
hold on;
s4 = scatter(ReimannLeft, yBackRight);
title("ReimannLeft plot");
```





RESULTS

Volume 1 = 275.6362 cubic units Volume 2 = 123.6570 cubic units

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