



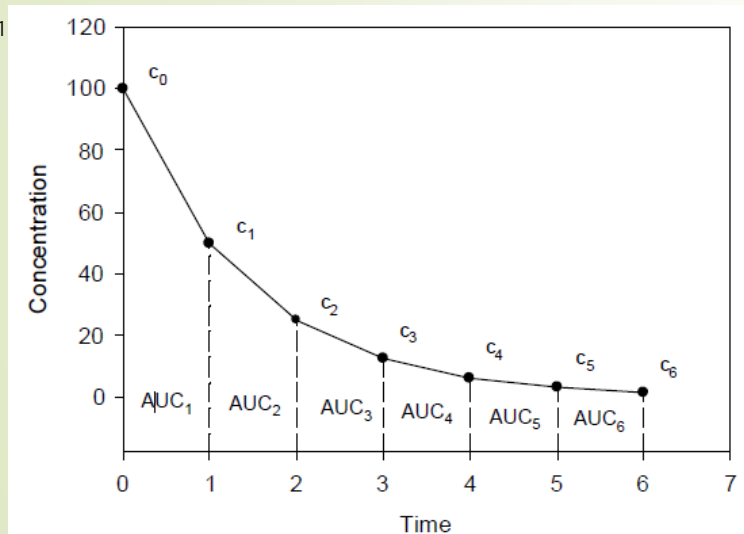
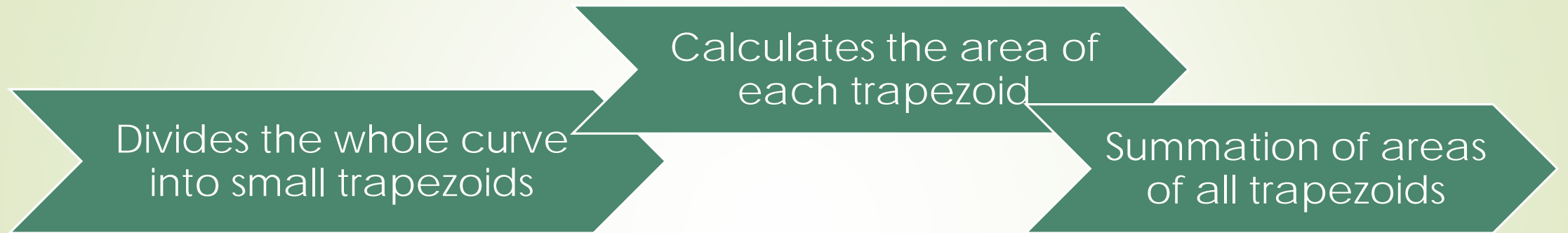
Area Under the Curve SAS

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Can be used in.....

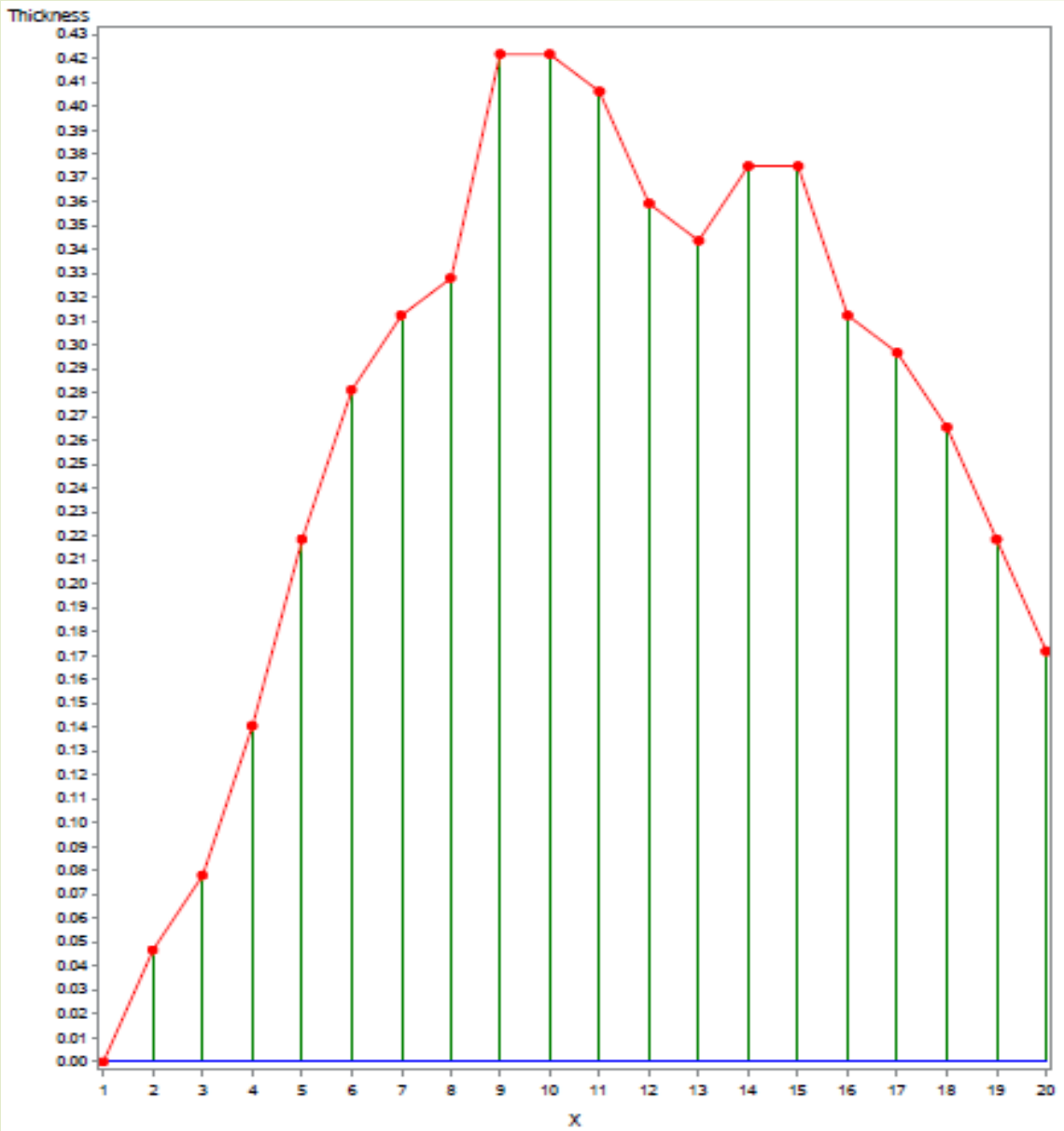
How does it calculate?



Area of trapezoid = Average of parallel sides * Height

Area of trapezoid with the first time interval:

$$AUC_1 = \frac{c_0 + c_1}{2} \times Time_{1-0}$$



The idea is to break down the curve into several points and then calculate the area of each trapezoid and then add them together.

Step 1

```
data adhesive;  
  input X Adhesive;  
  datalines;  
1 0  
2 0.03125  
3 0.046875  
4 0.0625  
5 0.046875  
6 0.0625  
;  
Run;  


---

  
Proc print data=adhesive;  
Run;
```

Result 1

The SAS System

Obs	X	Adhesive
1	1	0.000000
2	2	0.031250
3	3	0.046875
4	4	0.062500
5	5	0.046875
6	6	0.062500

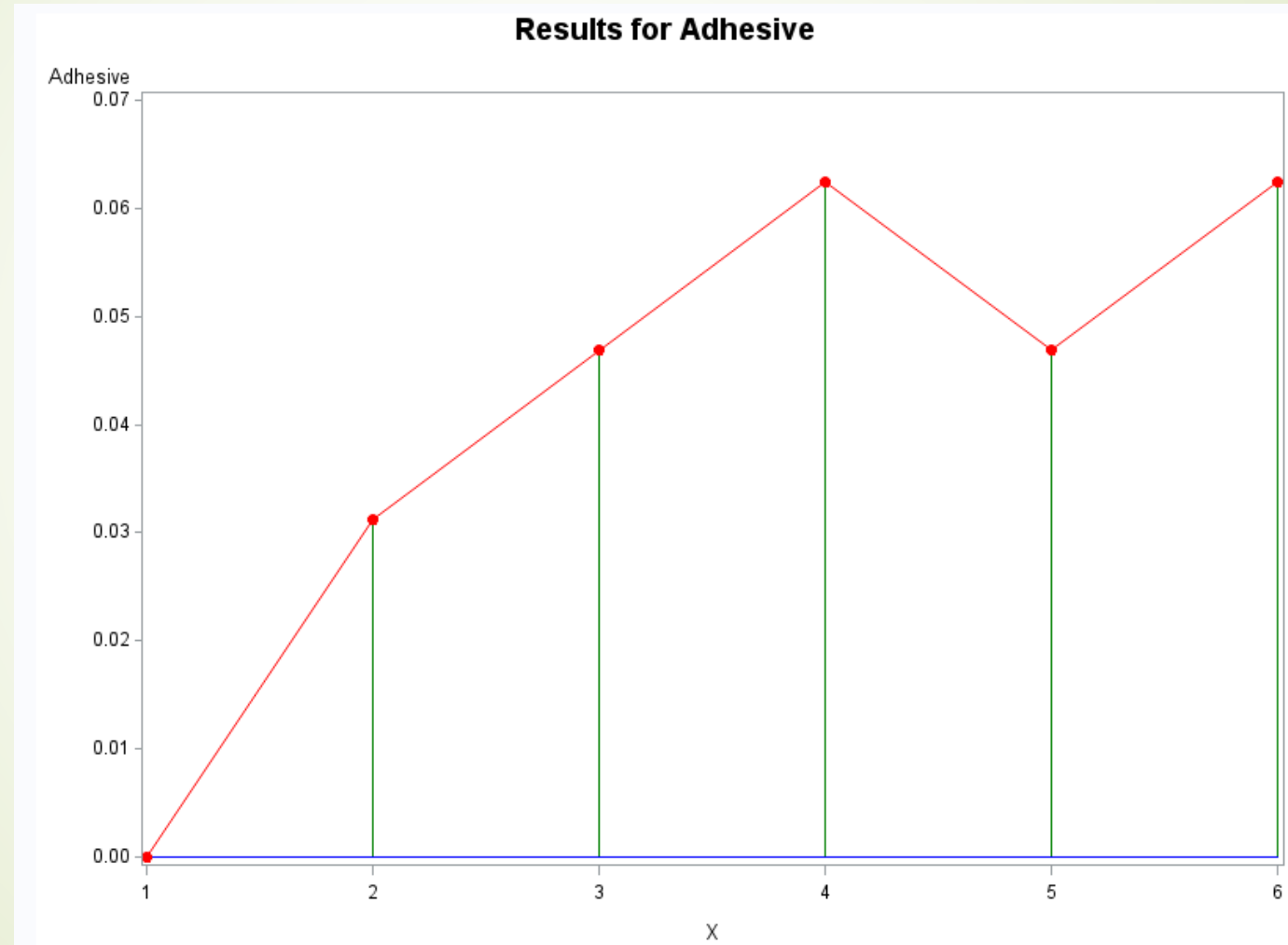
Step 2

```
symbol1 v=none c=green i=needle;  
symbol2 v=dot c=red i=join;
```

```
title "Results for Adhesive";
```

```
Proc gplot data=adhesive;  
plot Adhesive*X Adhesive*X / Overlay  
                                frame  
                                cvref=blue  
                                vminor=0 hminor=0;  
  
Run;
```

Result 2



Step 3

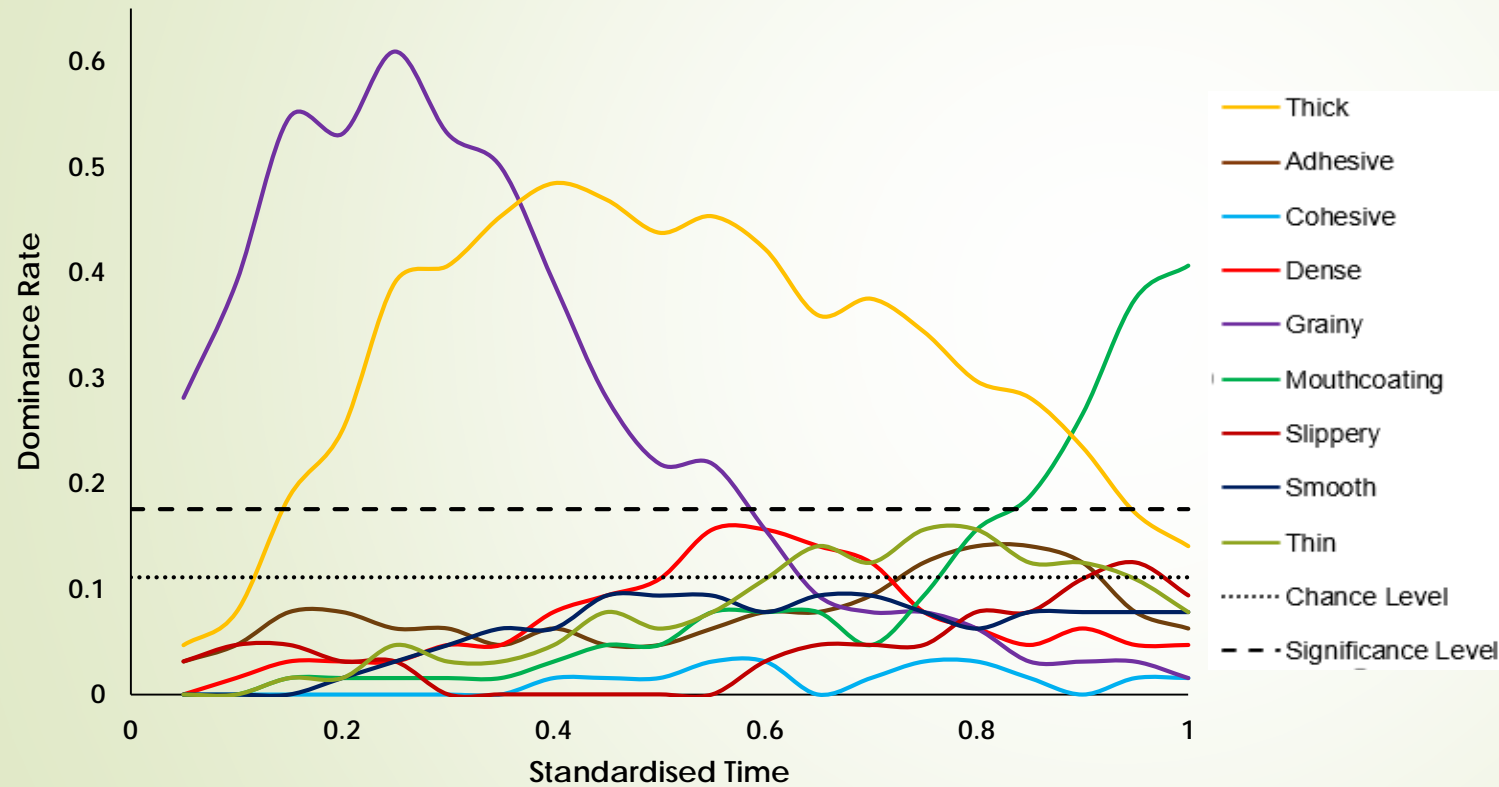
```
❑ Data adhesive (keep= X Adhesive TrapezoidAdhesive SumTrapezoidAdhesive);  
  set adhesive;  
  lagtime = lag(X);  
  lagvalue = lag(Adhesive);  
  if X = 0 then do;  
    lagtime = 0;  
    lagvalue = 0;  
  end;  
  trapezoidAdhesive = (X - lagtime) * (Adhesive + Lagvalue) / 2;  
  SumTrapezoidAdhesive + TrapezoidAdhesive;  
Run;  
❑ Proc print data=adhesive;  
Run;
```

Result 3

Results for Adhesive

Obs	X	Adhesive	trapezoidAdhesive	SumTrapezoidAdhesive
1	1	0.000000	.	0.00000
2	2	0.031250	0.015625	0.01563
3	3	0.046875	0.039063	0.05469
4	4	0.062500	0.054688	0.10938
5	5	0.046875	0.054688	0.16406
6	6	0.062500	0.054688	0.21875

How I used in my study



Attribute	AUC
Thick	5.29
Grainy	4.52
Adhesive	1.27
Thin	1.26
Mouthcoating	1.25
Dense	1.13
Smooth	1.08
Slippery	0.55
Cohesive	0.15

THANK YOU