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Math 371
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MATLAB LAB #5: Composite Simpson's algorithm **March 20, 2020**

Write a MATLAB code to implement the Composite Simpson's Rule (Algorithm 4.1). Use it to approximate the following integral:

$$\int_3^5 \frac{1}{\sqrt{x^2-4}}\,dx$$

with $n = 8$

Answer: $\int_3^5 \frac{1}{\sqrt{x^2-4}}\,dx \approx 0.604394076297428$

Listing 1: Composite Simpson's algorithm

```
%compsimpson.m
clc; format long;
a =3; b=5; n=8;
f = @(x) 1 / sqrt(x^2 − 4);

h = (b − a) / n ;
X = zeros(3, 1);

X(1) =  f(a) + f(b);

for i=1:n−1
  x =  a + i∗h;
  if ~mod(i,2) X(3) = X(3) + f(x); else X(2) = X(2) + f(x); end
end

XI = (h/3) ∗ ( X(1) + 2∗X(3) + 4∗X(2) )
```