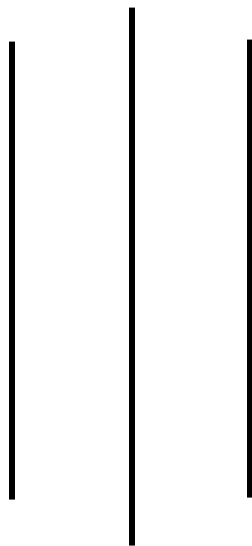




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**Lab Report On OCTAVE**

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## Lab 1

Evaluate  $\lim_{x \rightarrow 3} \frac{x^2-9}{x-3}$

```
>> pkg load symbolic
>> syms x
>> f(x)=(x^2-9)/(x-3)
f(x) = (symfun)
```

$$\frac{x^2 - 9}{x - 3}$$

```
>> limit(f,x,3)
ans = (sym) 6
```

## Lab 2

Evaluate  $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$

```
>> pkg load symbolic
>> syms x a n
>> f(x)=(x^n-a^n)/(x-a)
f(x) = (symfun)
```

$$\frac{x^n - a^n}{x - a}$$

```
>> limit(f,x,a)
ans = (sym)
```

$$a^{n-1} + a^{n-2}x + \dots + x^{n-1}$$

## Lab 3

Calculate  $\lim_{x \rightarrow 2} \frac{\sqrt{x+3} - \sqrt{5}}{\sqrt{x+1} - \sqrt{3}}$

```
>> pkg load symbolic
>> syms x
>> f(x) = (sqrt(x+3)- sqrt(5))/(sqrt(x+1)-sqrt(3))
warning: passing floating-point values to sym is dangerous, see "help sym"
warning: called from
    double_to_sym_heuristic at line 50 column 7
    sym at line 384 column 13
    minus at line 47 column 5

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warning: called from
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    sym at line 384 column 13
    minus at line 47 column 5

f(x) = (symfun)

      \/\ x + 3  - \/\ 5
      -----
      \/\ x + 1  - \/\ 3

>> limit(f,x,2)
ans = (sym)

      \/\ 15
      -----
      5
```

## Lab 4

Evaluate  $\lim_{x \rightarrow a} \frac{x \tan a - a \tan x}{x - a}$

---

```
>> pkg load symbolic
>> syms x
>> f(x)=(x*tan(a)-a*tan(x))/(x-a)
f(x) = (symfun)

      -a*tan(x) + x*tan(a)
      -----
      -a + x

>> limit (f,x,a)
ans = (sym)

      2
      - a*tan (a) - a + tan(a)
```

## Lab 5

Evaluate  $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin^2 x - 1}{x - \frac{\pi}{2}}$

```
>> pkg load symbolic
>> syms x
>> f(x)= (sin(x)^2-1)/(x-(pi/2))
warning: passing floating-point values to sym is dangerous, see "help sym"
warning: called from
    double_to_sym_heuristic at line 50 column 7
    sym at line 384 column 13
    minus at line 47 column 5

f(x) = (symfun)

      2
sin (x) - 1
-----
      pi
x - --
      2

>> limit (f,x,pi/2)
warning: passing floating-point values to sym is dangerous, see "help sym"
warning: called from
    double_to_sym_heuristic at line 50 column 7
    sym at line 384 column 13
    limit at line 92 column 5

ans = (sym) 0
```

## Lab 6

Evaluate  $\lim_{x \rightarrow 5^-} \frac{|x-5|}{x-5}$  and  $\lim_{x \rightarrow 5^+} \frac{|x-5|}{x-5}$

```
>> pkg load symbolic
>> syms x
>> f(x) = abs (x-5)/(x-5)
f(x) = (symfun)

|x - 5|
-----
x - 5

>> limit(f,x,5,"left")
ans = (sym) -1
>> limit (f,x,5,"right")
ans = (sym) 1
```

## Lab 7

Evaluate  $\lim_{x \rightarrow 0} \frac{\log(1+x)}{x}$

```
>> pkg load symbolic
>> syms x
>> f(x) = log(1+x)/x
f(x) = (symfun)

      log(x + 1)
      -----
             x

>> limit(f,x,0)
ans = (sym) 1
```

## Lab 8

Find the derivative of  $x^3 - 4x^2 + 9$

```
>> pkg load symbolic
>> syms x
>> f(x)=x^3-4*x^2+9
f(x) = (symfun)

      3      2
      x  - 4*x  + 9

>> diff(f,x)
ans(x) = (symfun)

      2
      3*x  - 8*x
```

## Lab 9

Find the third derivative of  $\sin^3 x$

```
>> pkg load symbolic
>> syms x
>> f(x)=sin(x)^3
f(x) = (symfun)

      3
      sin (x)

>> diff(f,x,3)
ans(x) = (symfun)

      /      2      2      \
      3*\- 7*sin (x) + 2*cos (x)/*cos(x)
```

## Lab 10

Calculate  $\int \frac{3x^2}{x^2+1}$

```
>> pkg load symbolic
>> syms x
>> f(x)= 3* x^2/(x^3+1)
f(x) = (symfun)
```

$$\frac{3x^2}{x^3 + 1}$$

```
>> int (f,x)
ans(x) = (symfun)
```

$$\frac{\log(x^3 + 1)}{3}$$

## Lab 11

Calculate  $\int_0^2 \frac{3x^2}{x^2+1}$

```
>> pkg load symbolic
>> syms x
>> f(x)=3*x^2/(x^3+1)
f(x) = (symfun)
```

$$\frac{3x^2}{x^3 + 1}$$

```
>> int (f,x,0,2)
ans = (sym) log(9)
```