

x	y	Area
0	0	
1	-3	-1.5
2	0	-1.5
3	9	4.5
4	24	16.5
	total	18

x	y	Area
0	0	
0.5	-2.25	-0.5625
1	-3	-1.3125
1.5	-2.25	-1.3125
2	0	-0.5625
2.5	3.75	0.9375
3	9	3.1875
3.5	15.75	6.1875
4	24	9.9375
	total	16.5

CHE 1411L Week 12 Lab Assignment

Example 9.2 - using the function

```
intexample(4)
intexample(1)
intexample(2)
intexample(8)
intexample(12)
intexample(20)
intexample(100)
format long
intexample(10000)
intexample(50000)
```

```
ans =

    18
```

```
ans =

    48
```

```
ans =

    24
```

```
ans =

16.5000000000000000
```

```
ans =

16.2222222222222221
```

```
ans =

16.0800000000000023
```

```
ans =

16.0032000000000064
```

```
ans =
```

16.000000319990953

ans =

16.000000012868973

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```
function SUM = intexample(k)
% Computes the integral of  $y=3x^2-6x$  for  $x = 0$  to  $4$ 

% k = Number of intervals

% Initialize the SUM (value of the integral)
SUM = 0;

% Calculate the increment value
increment = 4/k;

% Set the values for the first endpoint
x(1) = 0;
y(1) = 0;

% Calculate x and y values at the end of each interval, calculate the area
% for the interval, add to SUM
for i = 2: (k+1)
    x(i) = x(i-1) + increment;
    y(i) = 3*(x(i)^2)-6*x(i);
    SUM = SUM+.5*(y(i)+y(i-1))*(x(i)-x(i-1));
end

Not enough input arguments.

Error in intexample (line 10)
increment = 4/k;
```

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```
function SUM=intexample(k)

SUM=0;

increment=4/k;

x(1)=0;
y(1)=0;

for i=2:(k+1)
    x(i)=x(i-1)+increment;
    y(i)=3*(x(i)^2)-6*x(i);
    SUM=SUM+0.5*(y(i)+y(i-1))*(x(i)-x(i-1));
end
```

Not enough input arguments.

Error in intexample (line 5)
increment=4/k;

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Example 9.3

normdist.m		Activity.m		New to MATLAB? See resources for Getting Started .	
1	<code>function SUM = normdist(limit, k)</code>			>> <code>format long</code>	
2	<code>lower = -limit;</code>			>> <code>normdist(3,100)</code>	
3	<code>upper = limit;</code>			<code>ans =</code>	
4	<code>inc = (upper-lower)/k;</code>			<code>0.997292229481189</code>	
5	<code>SUM=0;</code>			>> <code>normdist(3,1000)</code>	
6	<code>x(1)=lower;</code>			<code>ans =</code>	
7	<code>y(1)=1/sqrt(2*pi)*exp(-x(1)^2/2);</code>			<code>0.997300124163755</code>	
8				>> <code>normdist(6,1000)</code>	
9	<code>for i=2:(k+1)</code>			<code>ans =</code>	
10	<code> x(i)=x(i-1)+inc;</code>			<code>0.999999998025951</code>	
11	<code> y(i)=1/sqrt(2*pi)*exp(-x(i)^2/2);</code>			>> <code>normdist(6,10000)</code>	
12	<code> SUM=SUM+.5*(y(i)+y(i-1))*(x(i)-x(i-1));</code>			<code>ans =</code>	
13	<code>end</code>			<code>0.999999998026819</code>	
14				>> <code>normdist(6,100)</code>	
15				<code>ans =</code>	
16				<code>0.999999997940018</code>	
				>> <code>normdist(5,100)</code>	
				<code>ans =</code>	
				<code>0.999999414352763</code>	

normdist.m ✕ Activity.m ✕ +

```
1 function SUM = normdist(Z)
2     lower = -6;
3     upper = Z;
4     inc = (upper-lower)/1000;
5     SUM=0;
6     x(1)=lower;
7     y(1)=1/sqrt(2*pi)*exp(-x(1)^2/2);
8
9     for i=2:(1001)
10         x(i)=x(i-1)+inc;
11         y(i)=1/sqrt(2*pi)*exp(-x(i)^2/2);
12         SUM=SUM+.5*(y(i)+y(i-1))*(x(i)-x(i-1));
13     end
14
15
16
```

Rectangular Snip

Command Window

New to MATLAB? See resources for [Getting Started](#).

```
>> normdist(0)

ans =

    0.4999999999013305

>> normdist(1)

ans =

    0.841343757033050
```

Example 9.4

The image shows the MATLAB R2022b interface with the following components:

- Editor:** Contains the function `normdist.m` with the following code:

```
1 function SUM=normdist(z)
2
3 lower=-6;
4 upper=6;
5 inc=(upper-lower)/1000;
6 SUM=0;
7 x(1)=lower;
8 y(1)=1/sqrt(2*pi)*exp(-(x(1)-2/2));
9
10 for i=2:1001
11     x(i)=x(i-1)+inc;
12     y(i)=1/sqrt(2*pi)*exp(-(x(i)-2/2));
13     SUM=SUM+0.5*(y(i)+y(i-1))*(x(i)-x(i-1));
14 end
15
```
- Command Window:** Shows the execution of the function:

```
0.841343757033050
>> format short
>> normdist(-1.33)
ans =
0.0918
>> normdist(2)
ans =
0.9772
>> normdist(2)-normdist(-1.33)
ans =
0.8855
fx >>
```
- Workspace:** Displays the variable `ans` with a value of `0.8855`.
- Current Folder:** Shows the file `normdist.m`.

$$x + y + z = 8$$

$$x - y + 2z = 6$$

$$3x + 5y - 7z = 14$$

$$\det D \begin{vmatrix} 1 & 1 & 1 \\ 1 & -1 & 2 \\ 3 & 5 & -7 \end{vmatrix} = 18$$

$$x - 2 + 13 + 8 = 18$$

$$\det x \begin{vmatrix} 8 & 1 & 1 \\ 6 & -1 & 2 \\ 14 & 5 & -7 \end{vmatrix} = 90$$

$$\det y \begin{vmatrix} 1 & 8 & 1 \\ 1 & 6 & 2 \\ 3 & 14 & -7 \end{vmatrix} = 30$$

$$\begin{aligned} &-(8)3 + 13 + 8 \\ &-24 + 14 + 44 \\ &-24 + 70 + 44 \end{aligned}$$

$$\begin{aligned} &-70 + 104 - 4 \\ &30 \end{aligned}$$

$$\det z \begin{vmatrix} 1 & 1 & 8 \\ 1 & -1 & 6 \\ 3 & 5 & 14 \end{vmatrix} = 24$$

$$-44 + 4 + 64 = 24$$

$$\begin{aligned} x &= \frac{18}{18} = 1 & x &= \frac{90}{18} = 5 & y &= \frac{30}{24} = 1.25 & z &= \frac{24}{18} = 1.33 \\ x &= \frac{90}{18} = 5 & y &= \frac{30}{18} = 1.6 \end{aligned}$$

Week 12 Lab Assignment

Problem 2:

$$x - y + z = 4$$

$$2x + y + z = 7$$

$$-x - 2y + 2z = -1$$

$$D = \begin{vmatrix} 1 & -1 & 1 \\ 2 & 1 & 1 \\ -1 & -2 & 2 \end{vmatrix}$$

$$D = [1(2 - (-2))] - [(-1)(4 - (-1))] + [1((-4) - (-1))]$$

$$D = 4 + 5 - 3$$

$$D = 6$$

$$D_x = \begin{vmatrix} 4 & -1 & 1 \\ 7 & 1 & 1 \\ -1 & -2 & 2 \end{vmatrix}$$

$$D_x = 18$$

$$x = \frac{D_x}{D} = \frac{18}{6} = 3$$

$$D_y = \begin{vmatrix} 1 & 4 & 1 \\ 2 & 7 & 1 \\ -1 & -1 & 2 \end{vmatrix}$$

$$D_y = 0$$

$$y = \frac{D_y}{D} = \frac{0}{6} = 0$$

$$D_z = \begin{vmatrix} 1 & -1 & 4 \\ 2 & 1 & 7 \\ -1 & -2 & -1 \end{vmatrix}$$

$$D_z = 6$$

$$z = \frac{D_z}{D} = \frac{6}{6} = 1$$

$$x=3, y=0, z=1$$

```
p=[1 2 -13 -14 24];  
roots(p)
```

```
r=[-4 3 -2 1];  
p=poly(r)
```

```
ans =
```

```
-4.0000000000000000  
 2.9999999999999998  
-1.9999999999999999  
 1.0000000000000000
```

```
p =
```

```
    1    2   -13   -14    24
```

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