

Math102
Chapter 5
Sec#5.2

Problem # 16

```
> restart: with(student):with(plots):  
Warning, the name changecoords has been redefined
```

Problem: Use leftpoint, midpoint and rightpoint rule to approximate area under the graph of

$$\int_0^2 e^{-x^2} dx \text{ for } n = 5, 10, 15 \text{ and } 100..$$

```
> f(x):=exp(-x^2);
```

$$f(x) := e^{-x^2}$$

```
> L5=evalf(leftsum(f(x), x=0..2,5));
```

$$L5 = 1.077467485$$

```
> L10=evalf(leftsum(f(x), x=0..2,10));
```

$$L10 = .9800072470$$

```
> L50=evalf(leftsum(f(x), x=0..2,50));
```

$$L50 = .9017053124$$

```
> L100=evalf(leftsum(f(x), x=0..2,100));
```

$$L100 = .8918957924$$

```
>
```

```
> R5=evalf(rightsum(f(x), x=0..2,5));
```

$$L5 = .6847937404$$

```
> R10=evalf(rightsum(f(x), x=0..2,10));
```

$$R10 = .7836703746$$

```
> R50=evalf(rightsum(f(x), x=0..2,50));
```

$$R50 = .8624379380$$

```
> R100=evalf(rightsum(f(x), x=0..2,100));
```

$$R100 = .8722621052$$

```
> Int(f(x),x=0..2)=evalf(int(f(x),x=0..2));
```

$$\int_0^2 e^{-x^2} dx = .8820813910$$

```
>
```