```
>
```
```
Warning, the name changecoords has been redefined

Warning, the protected names norm and trace have been redefined and unprotected
```
```
>
```
```
Warning, the name changecoords has been redefined

Warning, the protected names norm and trace have been redefined and unprotected
```

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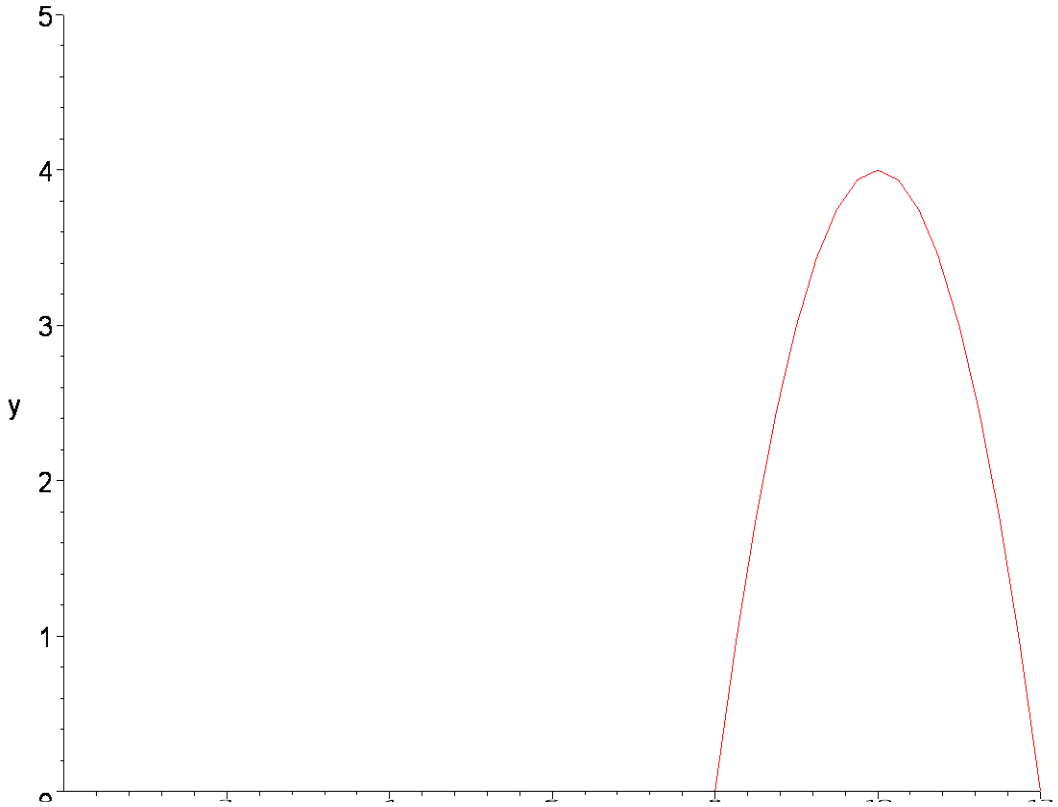
Lab 3

7)

```
> y1:=-(x-10)^2+4;
```

$$y1 := -(x-10)^2+4$$

```
> plot(y1,x=0..12,y=0..5);
```



a)

```
> Int(2*Pi*x*(y1),x=8..12);prob7(a):=value(%);
```

$$\int_{8}^{12} 2\,\pi\,x\,(-(x-10)^2+4)\,dx$$

$$\text{prob7}(a) := \frac{640}{3}\pi$$

b)

```
> Int(2*Pi*(x-2)*(y1),x=8..12);prob7(b):=value(%);
```

$$\int_{8}^{12} 2\,\pi\,(x-2)\,(-(x-10)^2+4)\,dx$$

$$\text{prob7}(b) := \frac{512}{3}\pi$$

10)

```
> a:=8;r:=4;
```

$$a := 8$$

$$r := 4$$

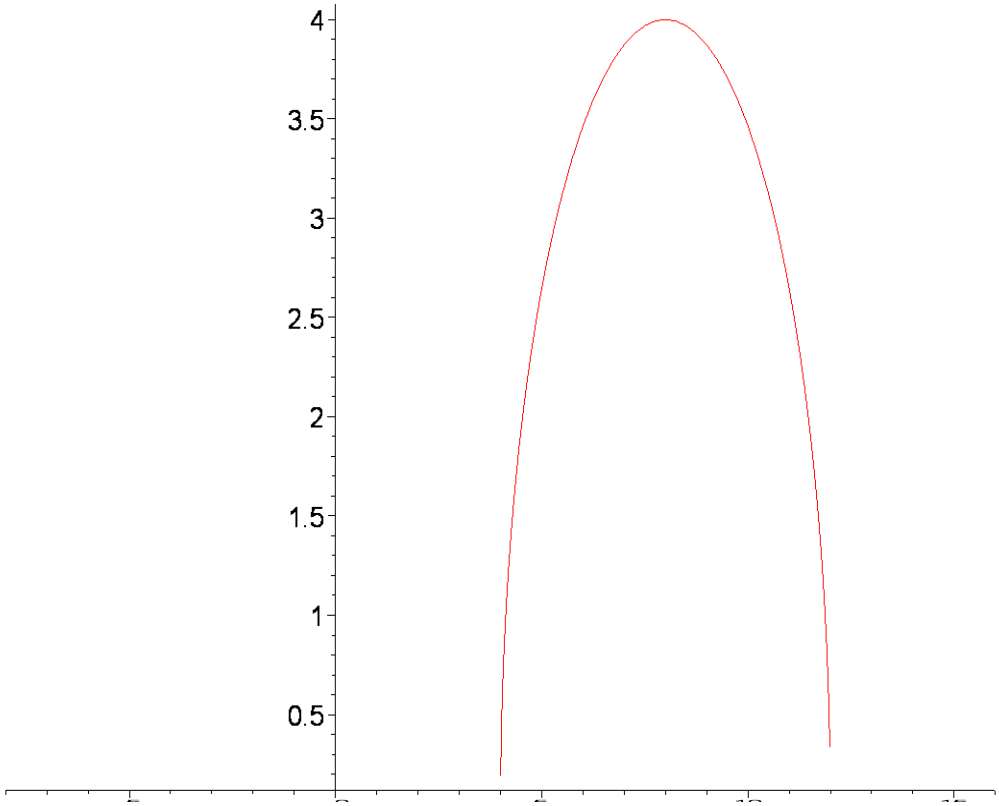
```
> x^2+y^2=r^2;
>
```

$$x^2 + y^2 = 16$$

```
> y1:=sqrt(r^2-(x-a)^2);
```

$$y1 := \sqrt{-48 - x^2 + 16\,x}$$

```
> plot(y1,x=-8..16);
```




```
> Int(2*Pi*x*y1,x=4..12);value(%);
>
```

$$\int_4^{12} 2\,\pi\,x\,\sqrt{-48-x^2+16\,x}\,dx$$

$$128\,\pi^2$$

Diamond

```
> y1:=x;y2:=(1/2-1)/(2-1)*x+3/2;x3:=2;y4:=0;
>
```

$$y1 := x$$

$$y2 := -\frac{1}{2}x+\frac{3}{2}$$

$$x3 := 2$$

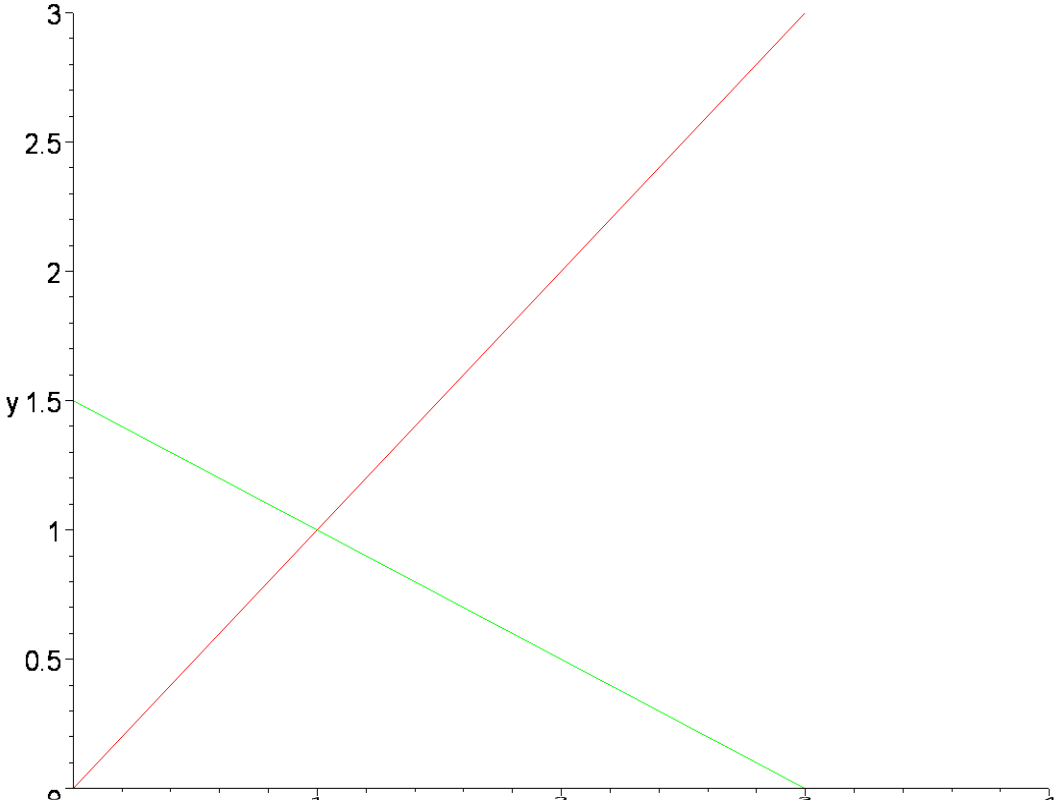
$$y4 := 0$$

```
> x1:=y;x2:=-2*y+3;
```

$$x1 := y$$

$$x2 := -2\,y+3$$

```
> plot({y1,y2,y3},x=0..4,y=0..3);
```



disc method

```
> Int(Pi*(y1)^2,x=0..1)+Int(Pi*y2^2,x=1..2);value(%);
```

$$\int_0^1 \pi\,x^2\,dx+\int_1^2 \pi\left(-\frac{1}{2}x+\frac{3}{2}\right)^2 dx$$

$$\frac{11}{12}\pi$$

shell method

```
> Int(2*Pi*y*(x1),y=0..1)+Int(2*Pi*y*(x2),y=1..2);value(%);
```

$$\int_0^1 2\,\pi\,y^2\,dy + \int_1^2 2\,\pi\,y\,(-2\,y+3)\,dy$$

$$\frac{1}{3}\pi$$