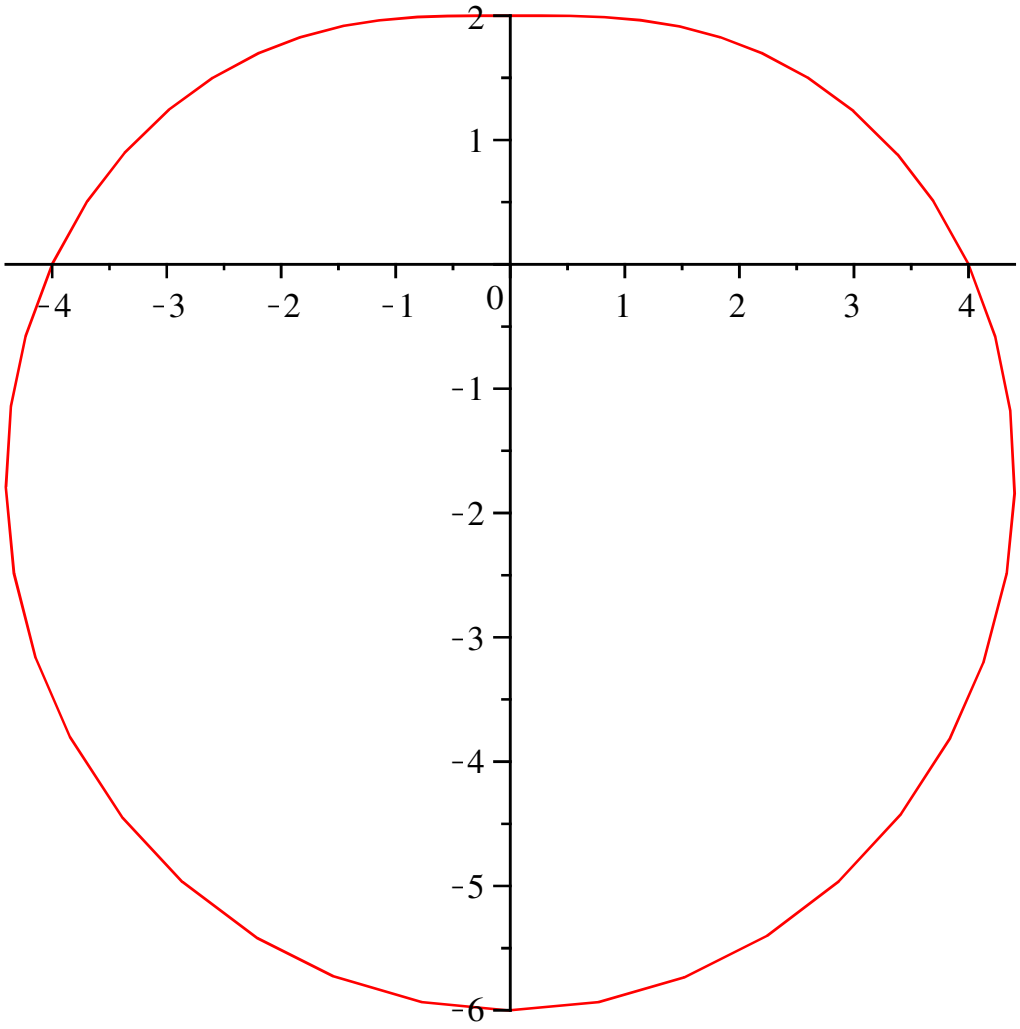
```
> restart:with( plots):with (student):
```

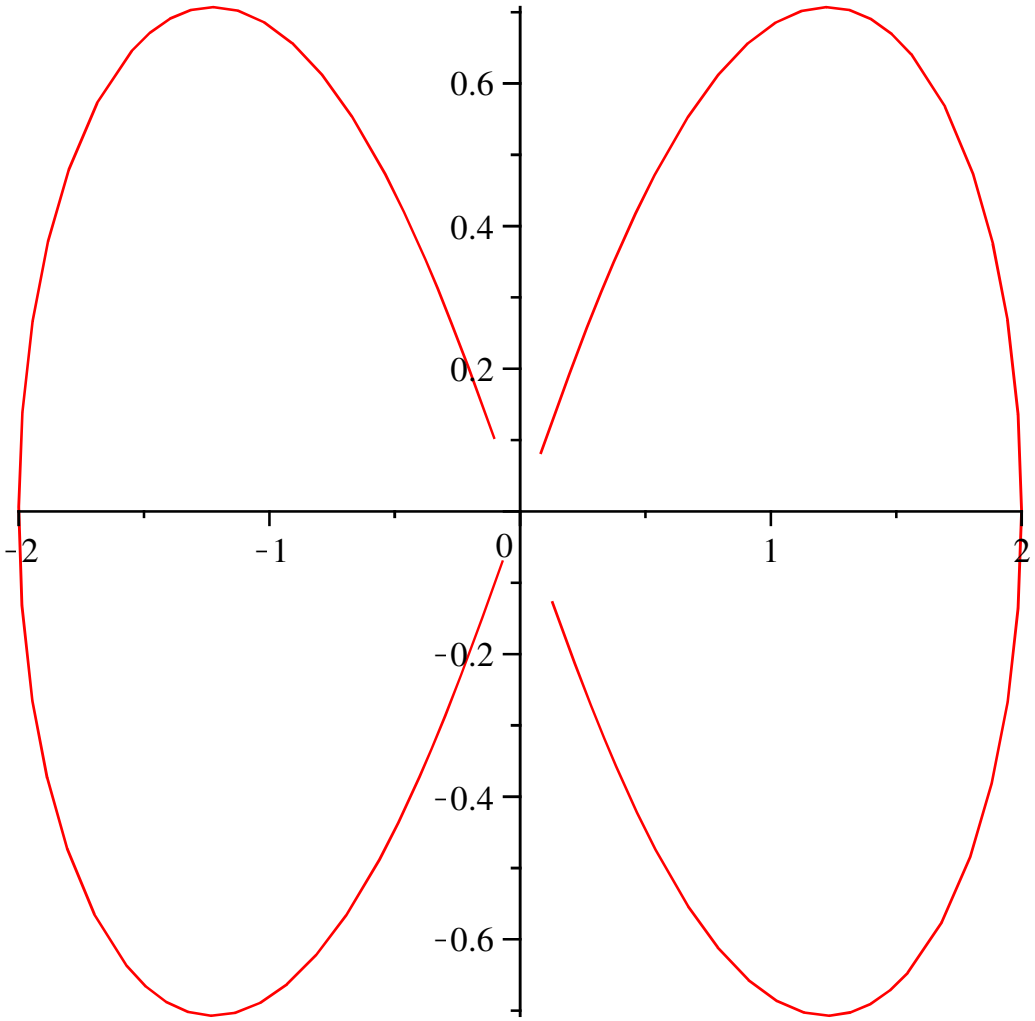
EX1

```
> plot(4 − 2· sin(theta), theta = 0 ..2*Pi, coords = polar);
```

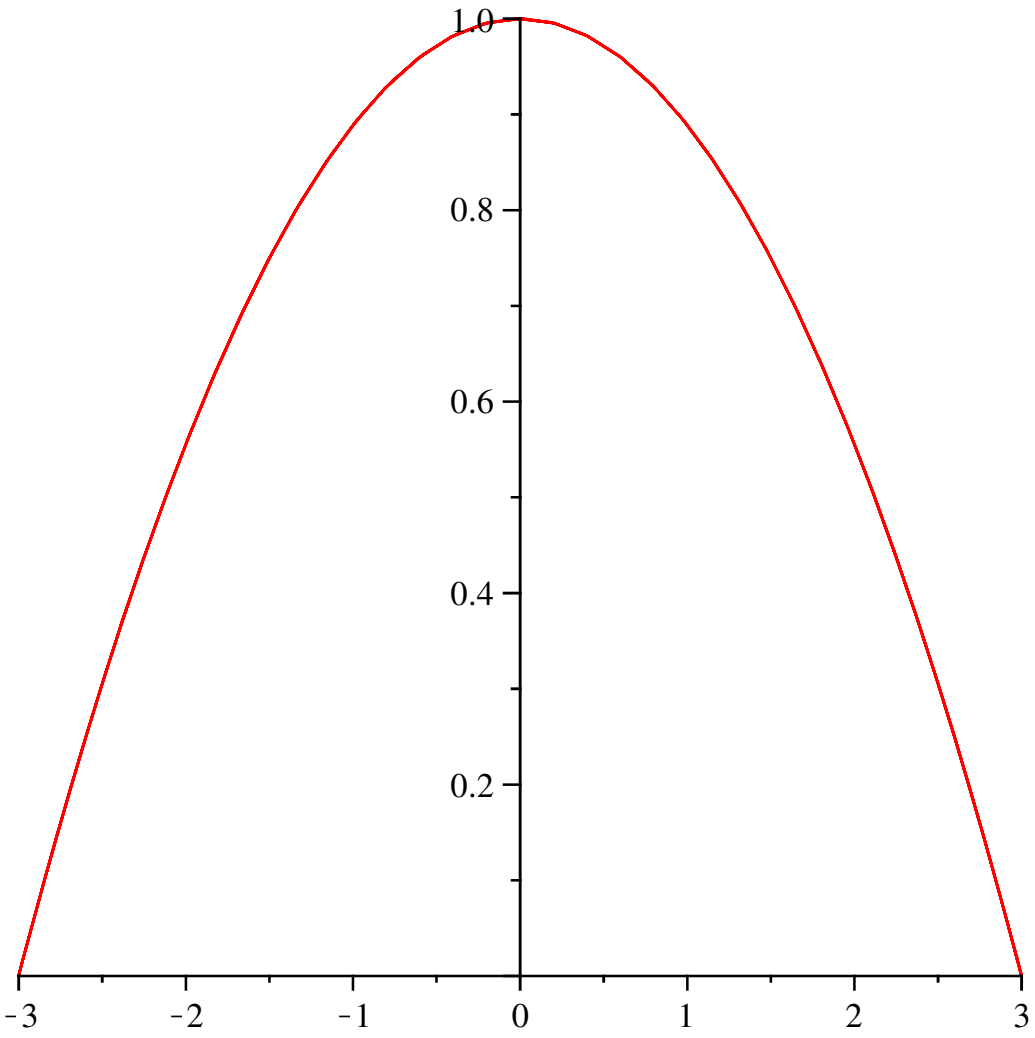



```
> plot( sqrt(4·cos(2· θ)), θ = 0 ..2*π, coords = polar);
```

Ex2

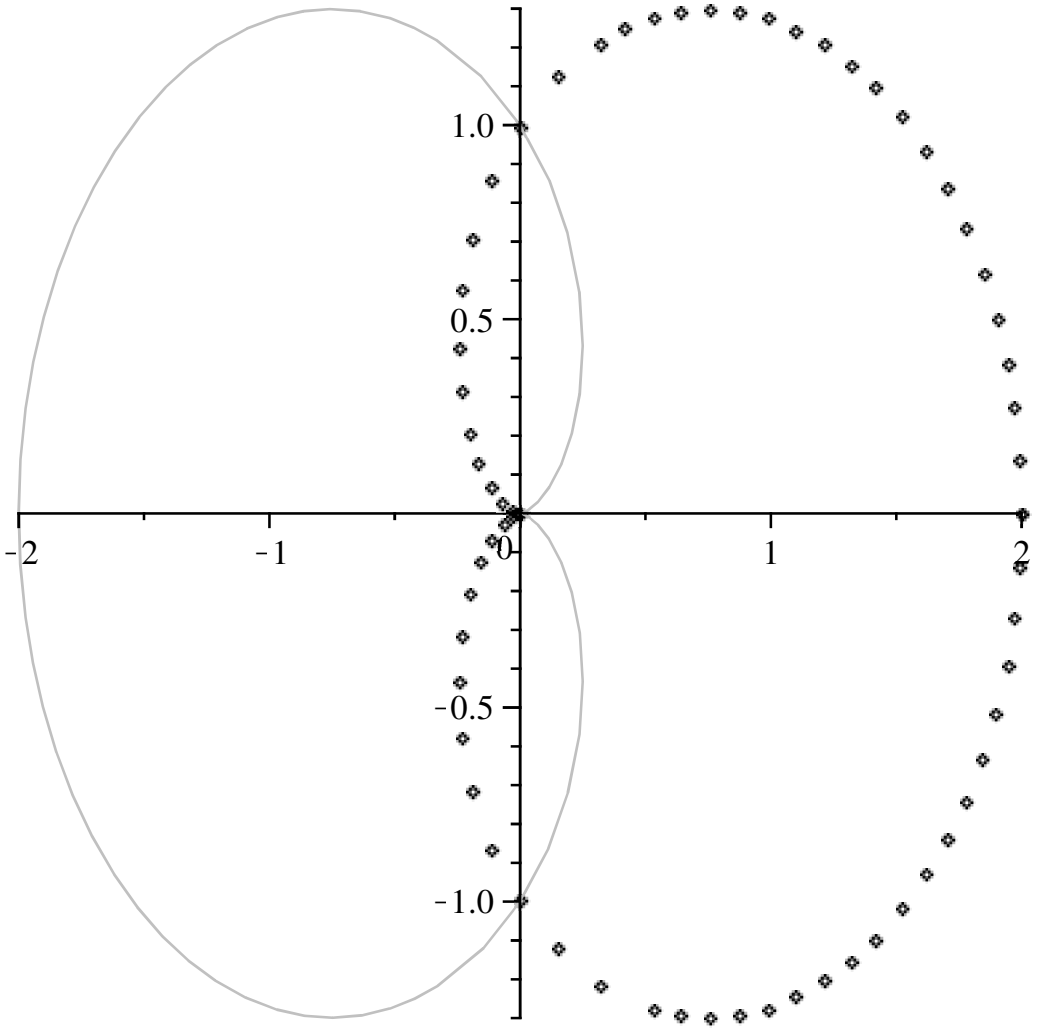



```
> plot([3· sin(t), (cos(t))^2, t = -2·Pi..2· Pi]);
```



ex 6

```
> plot([1 + cos(theta), 1 - cos(theta)], theta =0..2*Pi, coords =
  polar,color=[black,gray], style=[point,line]);
```




```
> g1 := theta -> 1 + cos(theta); g2 := theta -> 1 - cos(theta);
  2 .5 Int((g1(theta))^2, theta = 0 .. Pi/2) + 2 .5 Int((g2(theta))^2, theta = Pi/2 .. Pi) = 2
    .5 int((g1(theta))^2, theta = 0 .. Pi/2) + 2 .5 int((g2(theta))^2, theta = Pi/2 .. Pi);
```

$$g1 := \theta \to 1 + \cos(\theta)$$

$$g2 := \theta \to 1 - \cos(\theta)$$

$$1.0\left(\int_0^{\frac{1}{2}\pi} (1+\cos(\theta))^2 \, d\theta\right) + 1.0\left(\int_{\frac{1}{2}\pi}^{\pi} (1-\cos(\theta))^2 \, d\theta\right) = 1.500000000\,\pi + 4.0 \qquad \textbf{(1)}$$

```
>
```

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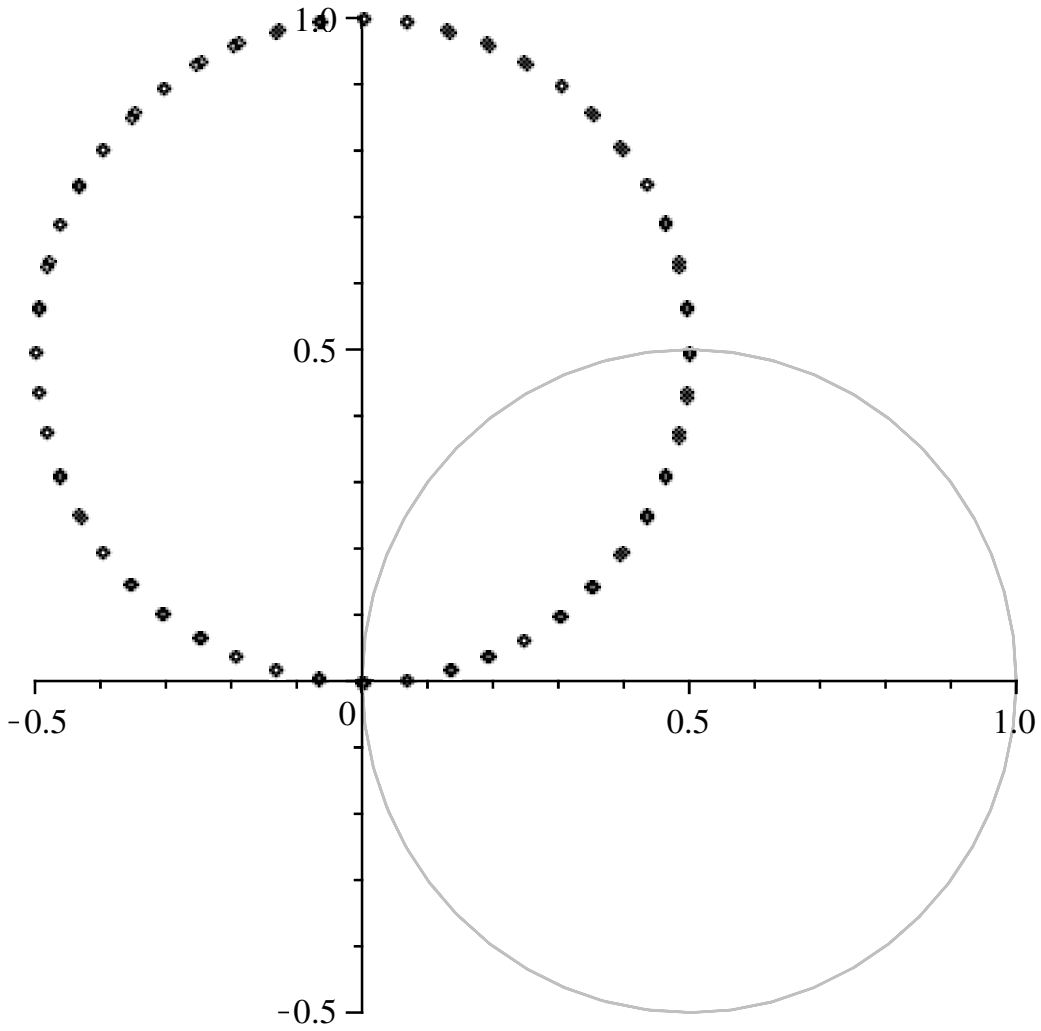
>
```

ex 7

```
> plot([sin(theta), cos(theta)], theta =0..2*Pi, coords = polar,
  color=[black,gray], style=[point,line]);
```

```
> g1 := theta -> sin(theta);
  2·.5 · Int( (g1(theta))^2, theta = 0 .. Pi/4 ) = 2 ·.5 · int( (g1(theta))^2, theta = 0 .. Pi/4 ) ;
```

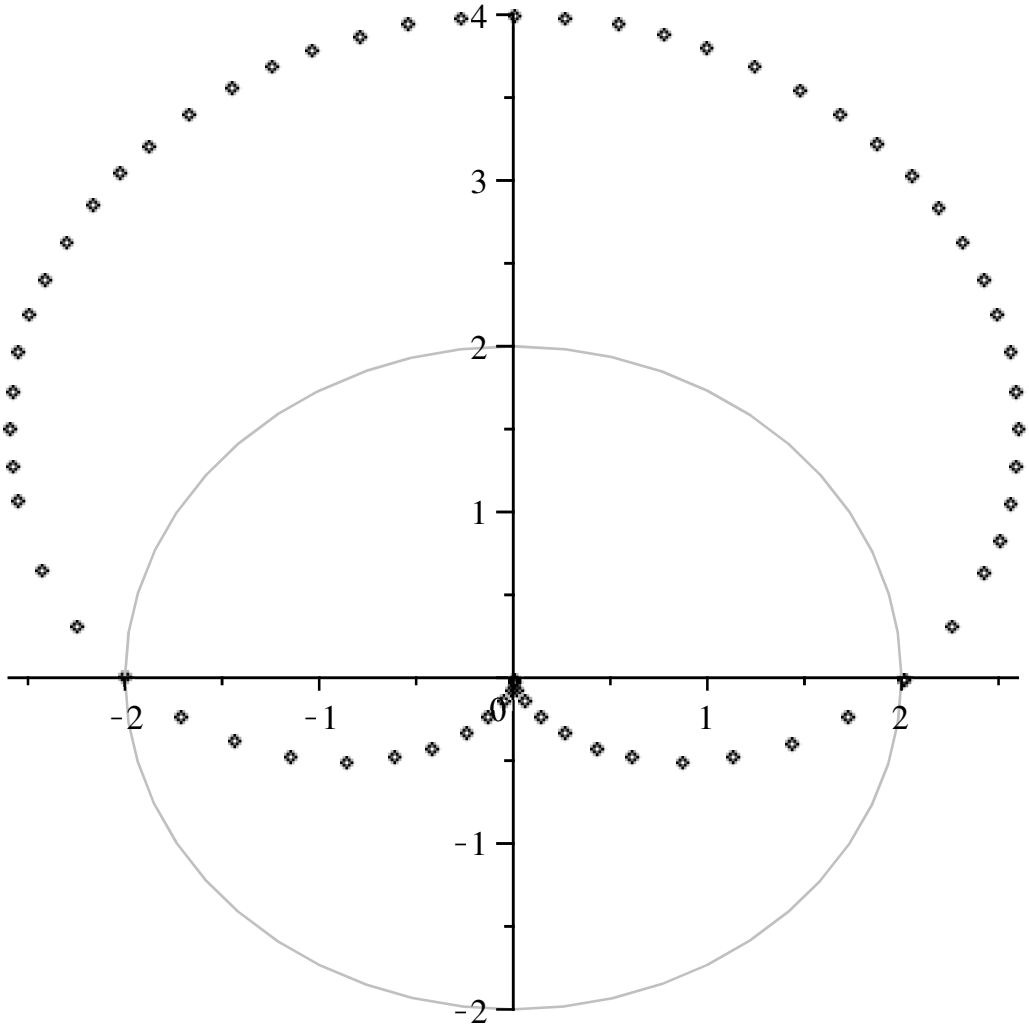


$$g1 := \theta \to \sin(\theta)$$

$$1.0 \left(\int_0^{\frac{1}{4}\pi} \sin(\theta)^2 \, d\theta \right) = -0.2500000000 + 0.1250000000\,\pi \qquad \textbf{(2)}$$

ex 8

```
> plot([2 + 2*sin(theta), 2], theta =0..2*Pi, coords = polar,
  color=[black,gray], style=[point,line]);
> g1 := theta -> 2 + 2·sin(theta); g2 := theta -> 2;
  2 ·.5 · Int( (g1(theta))^2, theta = 0 .. Pi/2 ) + 2 ·.5 · Int( (g2(theta))^2, theta = 3· Pi/2 .. 2· Pi )
    = 2 ·.5 · int( (g1(theta))^2, theta = 0 .. Pi/2 ) + 2 ·.5 · int( (g2(theta))^2, theta = 3· Pi/2 .. 2
    · Pi );
```

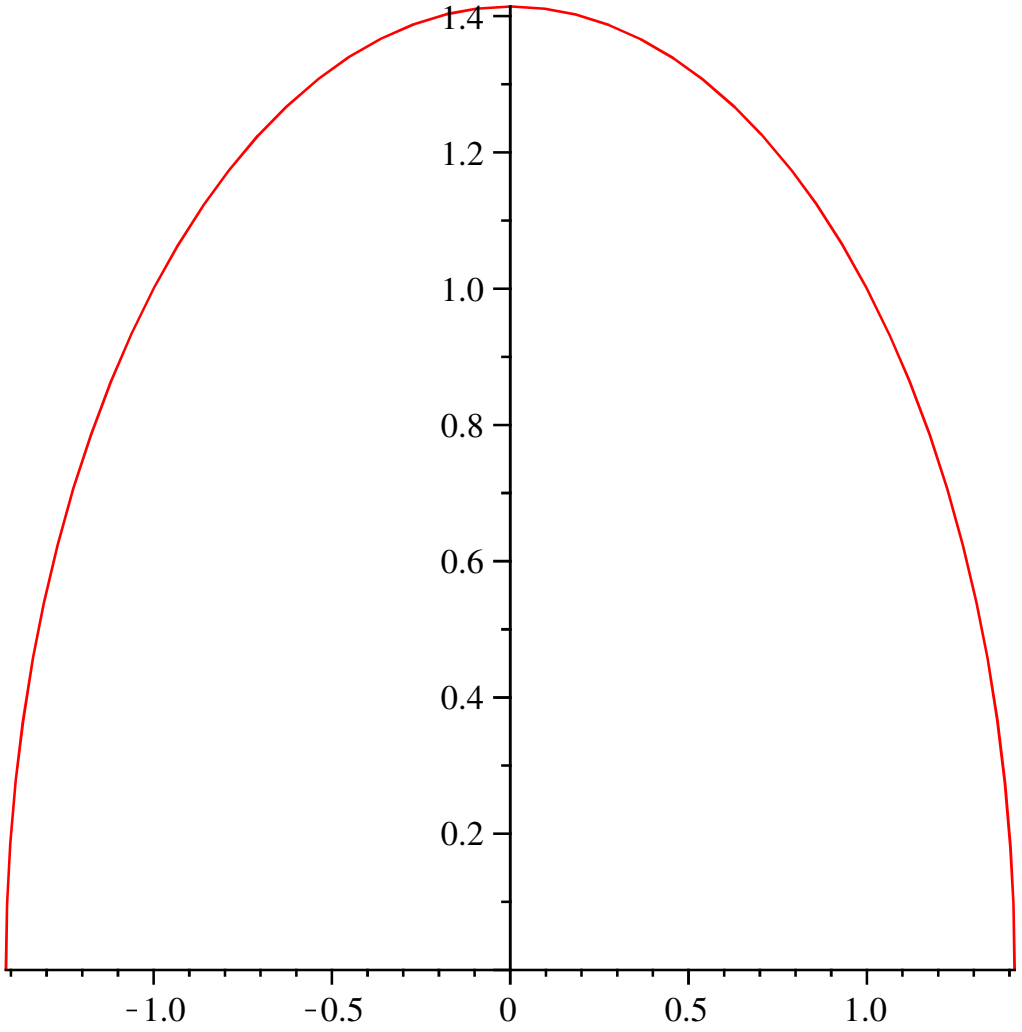


$$g1 := \theta \to 2 + 2\sin(\theta)$$

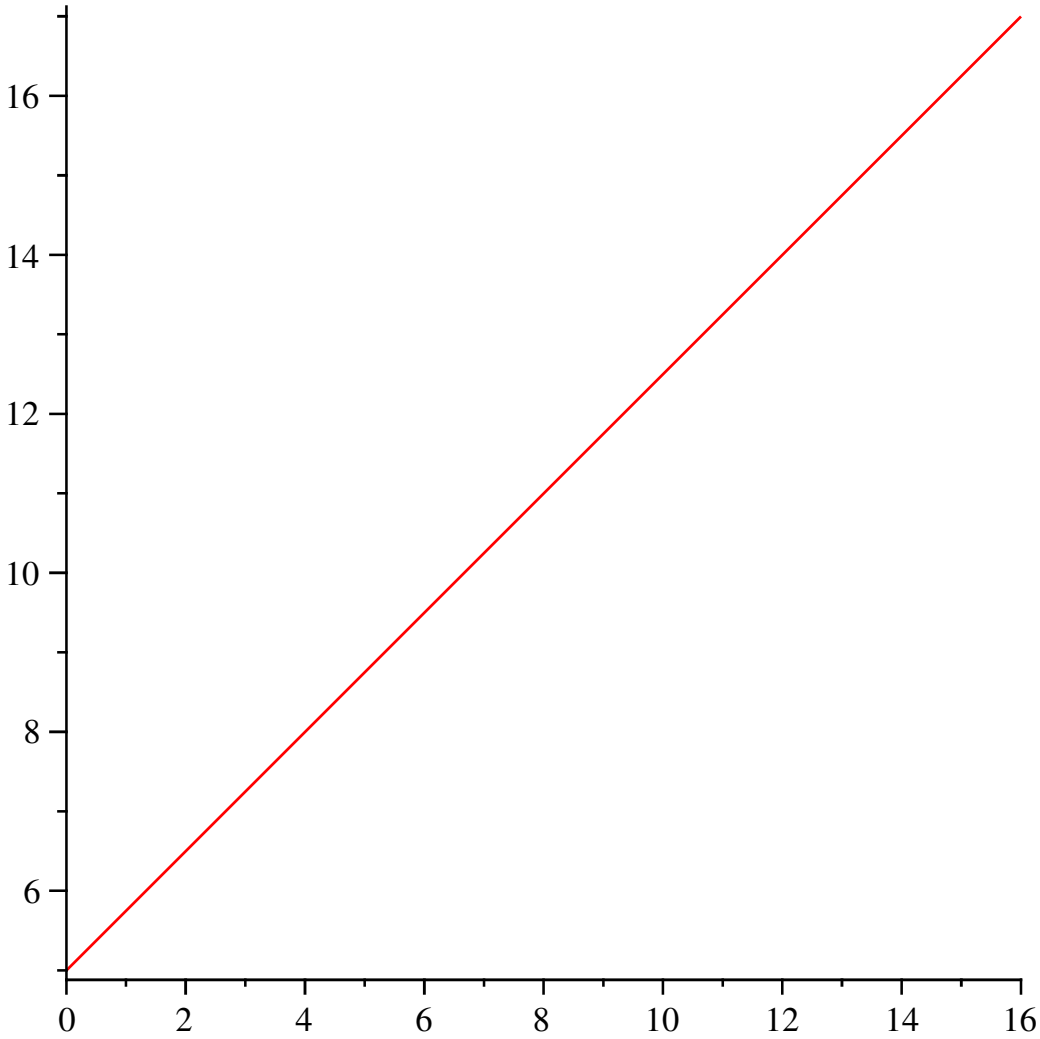
$$g2 := \theta \to 2$$

$$1.0\left(\int_0^{\frac{1}{2}\pi} (2 + 2\sin(\theta))^2 \, d\theta\right) + 1.0\left(\int_{\frac{3}{2}\pi}^{2\pi} 4 \, d\theta\right) = 8.0 + 5.0\,\pi \quad \textbf{(3)}$$

```
> plot([sqrt(2)· cos(t), sqrt(2)·sin(t), t = 0 .. Pi]);
```




```
> plot([4·t^2, 3·t^2 + 5, t = 0 .. 2]);
```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