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

1

a)

```
> int((2*x+5)/(x**2+4*x+5),x)
```

$$\ln(x^2 + 4x + 5) + \arctan(x + 2) \quad (1)$$

b)

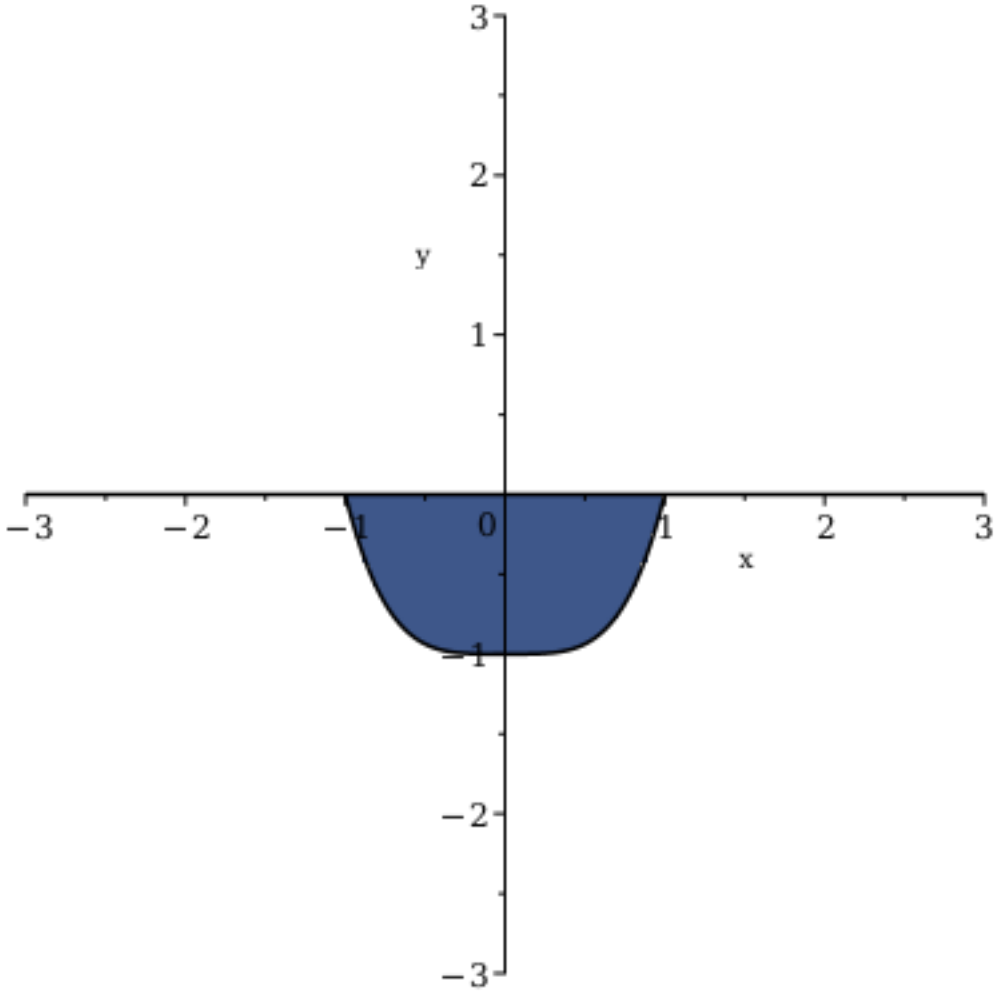
```
> int(1/(1+sin(2*x)), x=0..Pi/4)
```

$$\frac{1}{2} \quad (2)$$

2

a)

```
> f:= x-> 0:
> g := x-> x**4-1:
> inequal([x**4-1<=y, y<=0], x=-3..3, y=-3..3)
```



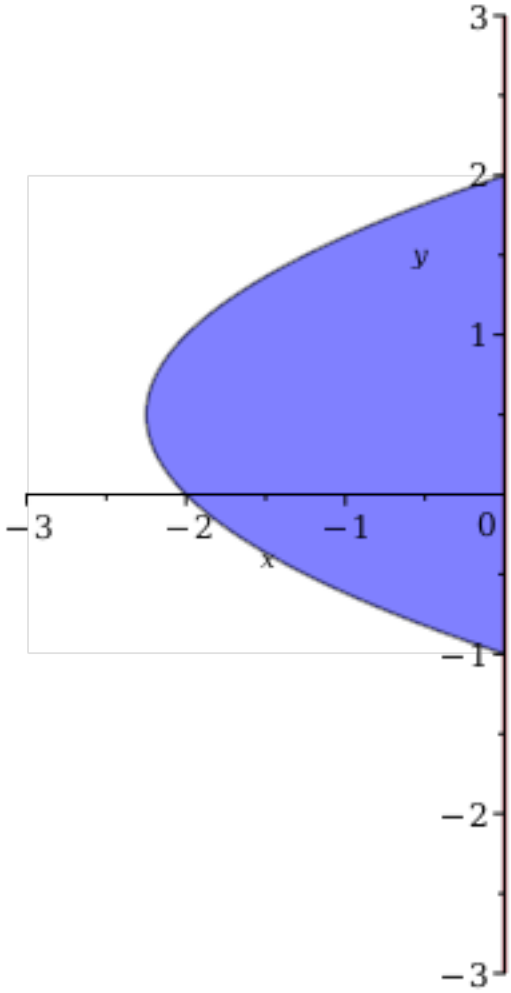

```
> int(abs(x**4-1), x=-1..1)
```

$$\frac{8}{5} \quad (3)$$

```
Error, `;` unexpected
```

b)

```
> par:=implicitplot(x=y**2-y-2, coloring=[blue, red], x=-3..0,y=-1.
  .2, filled=true, coloring=[white, blue], transparency=0.5):
> pr:= implicitplot(x=0, x=-3..3, y=-3..3):
> display(pr,par, scaling=constrained)
```

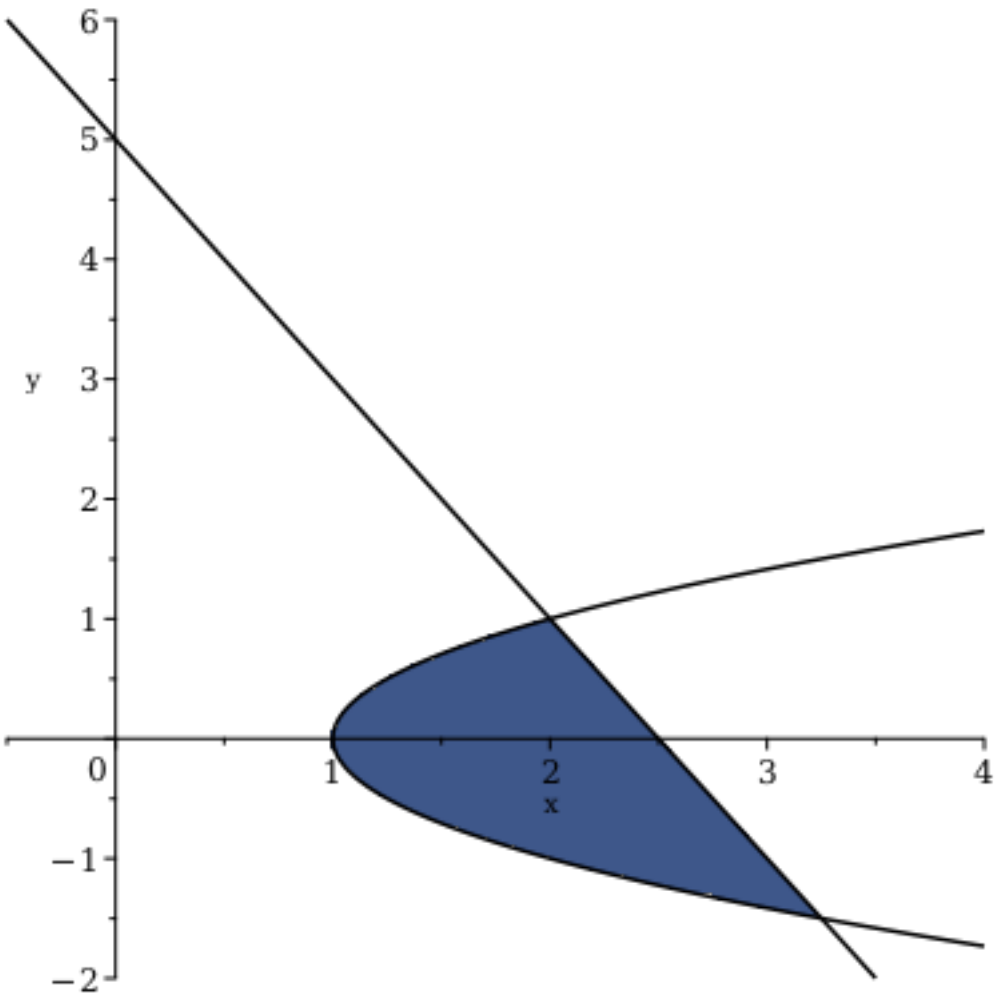



```
> int(abs(y**2-y-2), y=-1..2)
```

$$\frac{9}{2} \qquad (4)$$

c)

```
> inequal([x>=1+y**2, 5-2*x>=y])
```

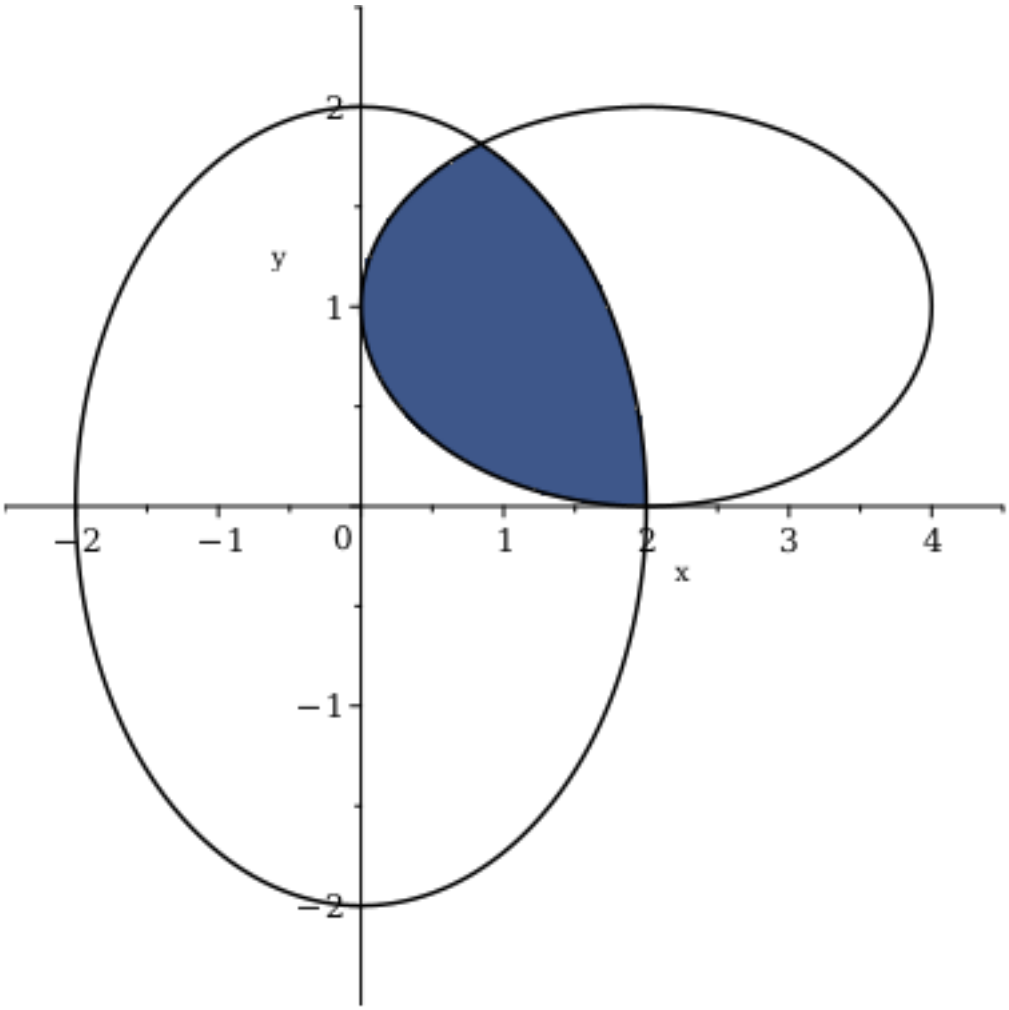



```
> int(abs(1+y**2), y=-1.5..1)
```

3.958333333 **(5)**

3)

```
> inequal([x**2+y**2<=4, (x-2)**2 + 4*(y-1)**2<=4])
```



4)

```
> Delta(H) = int(a + b*T + c/(T**2), T)
```

$$\Delta(H) = T\,a + \frac{b\,T^2}{2} - \frac{c}{T} \qquad (6)$$

```
> int(a + b*T + c/(T**2), T=10..25)
```

$$15\,a + \frac{525\,b}{2} + \frac{3\,c}{50} \qquad (7)$$

5)

```
> int(sqrt(1+(diff(x*tan(x),x)**2)), x=0..Pi/4)
```

$$\int_0^{\frac{\pi}{4}} \sqrt{1 + (\tan(x) + x\,(1 + \tan(x)^2))^2}\,dx \qquad (8)$$

$$\tan(x) + x\,(1 + \tan(x)^2) \qquad (9)$$

```
> evalf(int(sqrt(1+(diff(x*tan(x),x)**2)), x=0..Pi/4))
```

$$1.177640752 \qquad (10)$$