```
> restart;
> f:=1/4+4*t^2*(1-t);
  g:=1/4+sin(Pi*t);
```

$$f := \frac{1}{4} + 4\,t^2\,(1-t)$$

$$g := \frac{1}{4} + \sin(\pi\,t) \tag{1}$$

```
> df:=diff(f,t);
  dg:=diff(g,t);
```

$$df := 8\,t\,(1-t) - 4\,t^2$$

$$dg := \cos(\pi\,t)\,\pi \tag{2}$$

```
> A:=int(dg*f,t=0..1);
```

$$A := \frac{4\left(-12+\pi^2\right)}{\pi^3} \tag{3}$$

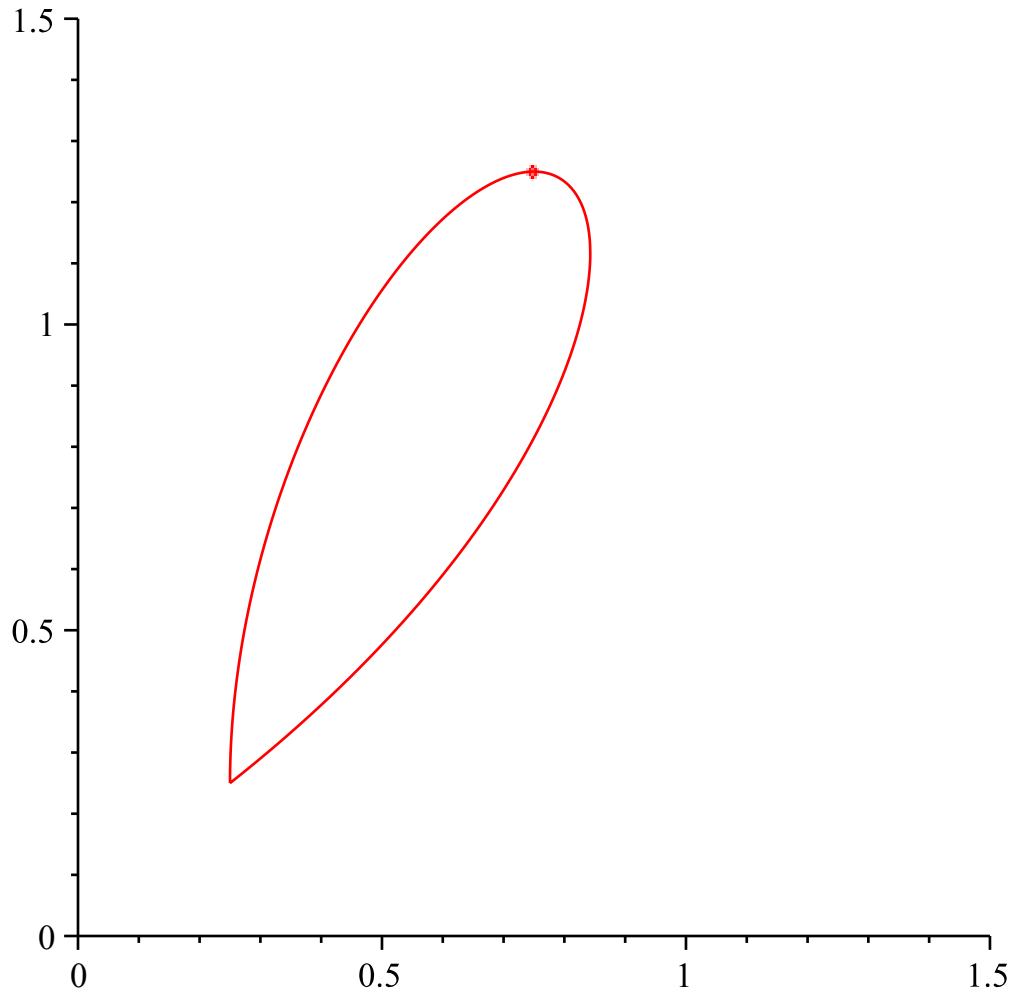
```
> Int(dg*f,t=0..1);
```

$$\int_0^1 \cos(\pi\,t)\,\pi\left(\frac{1}{4} + 4\,t^2\,(1-t)\right) dt \tag{4}$$

```
> evalf(A);
```

$$-0.2748341076 \tag{5}$$

```
> P1:=plot([f,g,t=0..1],view=[0..1.5,0..1.5]):
> P2:=plot([[3/4,5/4]],style=point):
> with(plots):
> display(P1,P2);
```




```
> x0:=subs(t=1/2,f);
  y0:=subs(t=1/2,g);
```

$$x0 := \frac{3}{4}$$

$$y0 := \frac{1}{4} + \sin\left(\frac{1}{2}\,\pi\right) \tag{6}$$

```
> simplify(y0);
```

$$\frac{5}{4} \tag{7}$$

```
> m:=subs(t=1/2,dg/df);
```

$$m := \cos\left(\frac{1}{2}\,\pi\right)\pi \tag{8}$$

```
> simplify(m);
```

$$0 \tag{9}$$

```
> series(exp(x^2),x=0,6);
```

$$1 + x^2 + \frac{1}{2}\,x^4 + O(x^6) \tag{10}$$

```
>
```