```
> unprotect(Diff);
> Diff := proc(f::algebraic,x::name) local u,v,n,y;
      if type(f,numeric) then 0
      elif type(f,name) then if f=x then 1 else 0 fi
      elif op(0,f)=`+` then add( Diff(u,x), u=f );
      elif op(0,f)=`*` then
         u := op(1,f); v := subsop(1=1,f);
         Diff(u,x)*v + Diff(v,x)*u
      elif op(0,f)=`^` and Diff(op(2,f),x)=0 then
         n := op(2,f); u := op(1,f);
         n*Diff(u,x)*u^(n-1)
      elif op(0,f)=exp then
         u := op(1,f); Diff(u,x)*exp(u);
      elif op(0,f)=int and type(op(2,f),name) then
         y := op(2,f); u := op(1,f);
         if x=y then u   # Diff( int(u(x),x), x ) ==> u(x)
         else int( Diff(u,x), y ); # Diff( int(u(x,y),y), x )
         fi
      elif type(f,function) and nops(f)=1 and Diff(op(1,f),x)=0 then 0
      else 'Diff'(f,x)
      fi
   end:
> Diff(2+x+3*x^2,x);
```
$$1 + 6\,x$$

```
> g := y*x^2*z-x*y+2*y*z;
```
$$g := y\,x^2\,z - x\,y + 2\,y\,z$$

```
> Diff(g,x);
```
$$2\,x\,z\,y - y$$

```
> Diff(u(x)/v(x)+1/w(x),x);
```
$$\frac{\dfrac{d}{dx}\,u(x)}{v(x)} - \frac{\left(\dfrac{d}{dx}\,v(x)\right)u(x)}{v(x)^2} - \frac{\dfrac{d}{dx}\,w(x)}{w(x)^2}$$

```
> Diff( exp(-2*x)+sin(2*x)+ln(2)*x, x );
```
$$-2\,e^{-2\,x} + \frac{d}{dx}\,\sin(2\,x) + \ln(2)$$

```
> g := int(2*x*f(t),t);
```
$$g := \int 2\,x f(t)\,dt$$

```
> Diff(g,t);
```
$$2\,x f(t)$$

```
> Diff(g,x);
```
$$\int 2\,f(t)\,dt$$