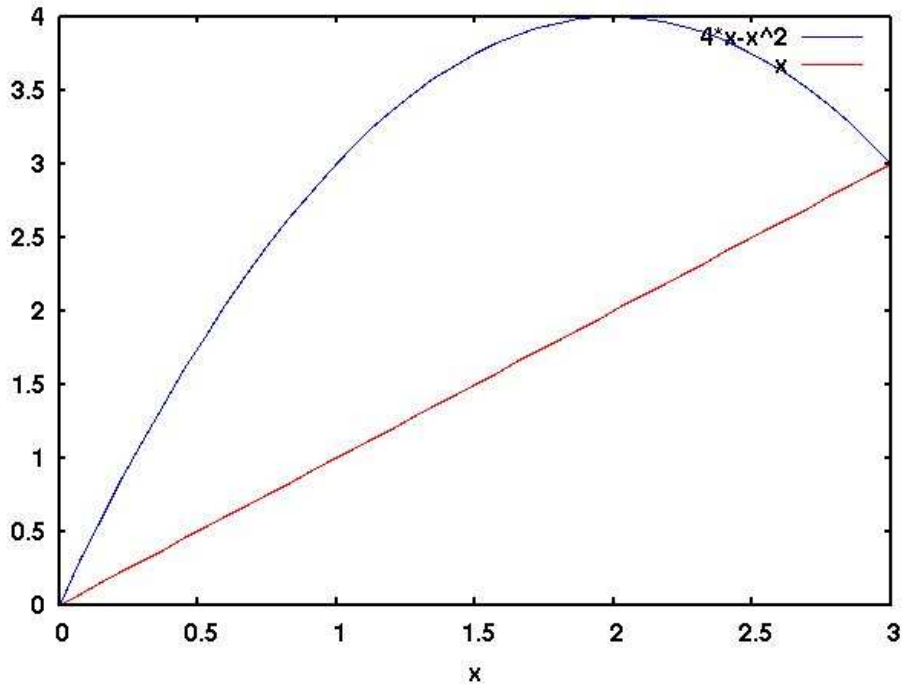


Maxima 5.13.0 <http://maxima.sourceforge.net>
Using Lisp GNU Common Lisp (GCL) GCL 2.6.7 (aka GCL)
Distributed under the GNU Public License. See the file COPYING.
Dedicated to the memory of William Schelter.
This is a development version of Maxima. The function bug_report()
provides bug reporting information.

This is redoing the Maple worksheet from Honors Calculus II April 12, 2010 using Maxima.

```
(%i1) f:1/(1+x^2);
(%o1)  $\frac{1}{x^2+1}$ 
(%i2) df:diff(f,x);
(%o2)  $-\frac{2x}{(x^2+1)^2}$ 
(%i3) a:integrate(sqrt(1+df^2),x,0,2);
(%o4)  $\int_0^2 \sqrt{\frac{4x^2}{(x^2+1)^4}+1} dx$ 
(%i5) quad_qags(sqrt(1+df^2),x,0,2);
(%o5) [2.177856708765146, 6.4408309387326249  $\times 10^{-11}$ , 63, 0]
(%i6) eq1:y=4*x-x^2;
      eq2:y=x;
(%o6)  $y=4x-x^2$ 
(%o7)  $y=x$ 
(%i8) solve([eq1,eq2],[x,y]);
(%o8) [[x=3, y=3], [x=0, y=0]]
(%i9) A:integrate(4*x-x^2-x,x,0,3);
(%o9)  $\frac{9}{2}$ 
(%i10) p:4*x-x^2;
(%o10)  $4x-x^2$ 
(%i11) plot2d([p,x],[x,0,3])$
```



0.238999, 0.0584025

(%i14) `xbar:1/A*integrate(x*(p-x),x,0,3);`

(%o14) $\frac{3}{2}$

(%i15) `ybar:1/A*integrate((p+x)/2*(p-x),x,0,3);`

(%o15) $\frac{12}{5}$

(%i16) `taylor(exp(h),h,0,7);`

(%o20) $1 + h + \frac{h^2}{2} + \frac{h^3}{6} + \frac{h^4}{24} + \frac{h^5}{120} + \frac{h^6}{720} + \frac{h^7}{5040} + \dots$

(%i21) `taylor(sin(h),h,0,10);`

(%o21) $h - \frac{h^3}{6} + \frac{h^5}{120} - \frac{h^7}{5040} + \frac{h^9}{362880} + \dots$

(%i22) `s1:taylor(cos(sin(h)),h,0,10);`

(%o23) $1 - \frac{h^2}{2} + \frac{5h^4}{24} - \frac{37h^6}{720} + \frac{457h^8}{40320} - \frac{389h^{10}}{172800} + \dots$

(%i24) `s2:taylor(cos(h),h,0,10);`

(%o24) $1 - \frac{h^2}{2} + \frac{h^4}{24} - \frac{h^6}{720} + \frac{h^8}{40320} - \frac{h^{10}}{3628800} + \dots$

(%i25) `(s1-s2)/h^4;`

(%o27) $\frac{1}{6} - \frac{h^2}{20} + \frac{19h^4}{1680} - \frac{1021h^6}{453600} + \dots$

```
(%i28) n1:cos(sin(h))-cos(h);
```

```
(%o29) cos(sin(h))-cos(h)
```

```
(%i30) d1:h^4;
```

```
(%o30) h^4
```

```
(%i31) n2:diff(n1,h,4);
```

```
(%o31) -6 cos(h)^2 sin(h) sin(sin(h)) - sin(h) sin(sin(h)) - 3 sin(h)^2 cos(sin(h)) + cos(h)^4 cos(sin(h)) + 4 cos(h)^2 cos(sin(h)) - cos(h)
```

```
(%i32) d2:diff(d1,h,4);
```

```
(%o32) 24
```

```
(%i33) a2:subst(h=0,n2/d2);
```

```
(%o33)  $\frac{1}{6}$ 
```

```
(%i34)
```