Maximasekvenser

Detta dokument innehåller bokens Maximasekvenser så att man enkelt kan kopiera dem till Maxima.

2.1 `2.56; 1/2; 15/25; %pi; sqrt(2); sqrt(4);`

2.2 `1/2,numer; %pi,numer; sqrt(2),numer;`

2.3 `(3/5)/2; 3/(5/2); 3/5/2;`

2.4 `126/150; 9/10-3/14-13/21; (5/12+2/3)/(17/10-3);`

2.5 `2^(1/2); 2^(1/2),numer; 2^0.5; 4^(1/2); 4^0.5;`

3.1 `expr1:(s+t)^2-(s-t)^2; expand(expr1);`

3.2 `expr2:(a/2-(8-a)/(a-2))/(a-4); factor(expr2);`

3.3 `expr3:(1/a+1/b)/(1/a-1/b); factor(expr3);`

3.4 `expr4:(a*b-2*c*d)/(2*b*d); expand(expr4);`

3.5 `ekv:10+5*x-2*x^2=20*x-5*x^2-8$ solve(ekv);`

3.6 `solve(x^2+a*x+9=0,x);`

3.7 `solve(x^2+10=0);`

3.8 `expand(y*(y-1)*(y+1));`

3.9 `pol:(s^4+2*s^2)*(-s^2-3)*(3/4+(1/2)*s); expand(pol);`

3.10 `divide(x^3+x^2+x+1,x-1);`

3.11 `quotient(x^3+x^2+x+1,x-1),`

3.12 `remainder(x^3+x^2+x+1,x-1);`

3.13 `divide(x^3+x^2+x+1,x+1);`

3.14 `divide(x^5+x^2+1,x^2-2*x+1);`

3.15 `f1:(x^2-1)/(x^2-x); factor(f1); ratsimp(f1);`

3.16
```
f2:((2*x+3)^2-(x-3)^2)/(4-(x+2)^2); factor(f2);
ratsimp(f2);
```

3.17 `ekv:(x^2+9)*(x^2-9)=9*x^2-x^4; solve(ekv);`

3.18 `expr:x^5+200x^2+100x-1500; find_root(expr,-5,5);`

3.19 `expr2:(x+6)^(1/3)-x; solve(expr2=0); find_root(expr2,0,5);`

3.20
```
load(solve_rat_ineq)$
solve_rat_ineq(x+4>60/x);
```

4.1 `sum(k,k,0,10);`

4.2
```
sum(k,k,1,n);
%,simpsum;
```

4.3 `sum(4+k*3,k,0,p),simpsum;`

4.4 `ratsimp(%); factor(%);`

4.5 `sum((i/n)^2,i,1,n),simpsum;`

4.6
```
sum((-1)^(i+1)*(2/(3^i)),i,0,n)-sum((-1)^(i+1)*5^i,i,0,n),
simpsum;
```

4.7
```
expand((1+x)^3); expand((2-t)^4); expand((3*a+2*b)^3);
```

5.1
```
load(implicit_plot)$
implicit_plot(x^2+y^2=16, [x,-5,5], [y,-5,5], same_xy)$
```

5.2
```
load(implicit_plot)$
implicit_plot([9*x^2-4*y^2=9, 2*y+3*x=0, 2*y-3*x=0],
[x,-4,4], [y,-4,4], same_xy)$
```

6.1
```
sin(%pi/2); cos(45*%pi/180); cos(1);
```

6.2
```
sin(%pi/2), numer; cos(45*%pi/180), numer; cos(1), numer;
```

6.3
```
trigexpand(cos(2*v)); trigsimp((sin(v))^2+(cos(v))^2);
trigexpand(sin(u+v)); trigexpand(sin(3*v));
trigreduce(cos(u)*cos(v));
trigreduce((sin(x))^3);
```

6.4
```
acos(0); asin(1); acos(0.5); asin(-1/2);
```

7.1
```
log(1); log(%e); log(%e^2); log(10);
```

7.2
```
log(10), numer; log(100), numer; log(10.0);
```

7.3
```
log(2)/log(10), numer; log(100)/log(10), numer;
```

7.4
```
log(5)/3, numer;
```

8.1
```
f(x):=x^2; f(-1); f(2); plot2d(f(x), [x,-3,3])$
```

8.2
```
plot2d([x^2, 9-x^2], [x,-3,3], same_xy)$
g2(x):=if x<-1 then x+2 else if x<1 then 1 else -x+2$
plot2d(g2(x), [x,-3,3], [y,-1,1.5])$
```

8.3
```
plot2d([x/2+5, 2*x-10, x], [x,-20,20], same_xy)$
```

8.4
```
f(x):=1/x$
plot2d(f(x), [x,-5,5])$
```

8.5
```
plot2d(f(x), [x,-5,5], [y,-5,5])$
```

8.6
```
load(implicit_plot)$
implicit_plot(x^2+y^3=5, [x,-5,5], [y,-5,5])$
```

9.1
```
limit((x^2-4)/(4*(x-2)), x,2);
limit(sqrt(1+3/x), x, minf);
limit(cos(x)*1/x, x, inf);
```

10.1
```
f(x):=x^2$ g(x):=2*x-1$ plot2d([f(x), g(x)], [x,0.5,1.5])$
plot2d([f(x), g(x)], [x,0.99,1.01])$
```

10.2
```
f(x):=x^3+sin(x); 'diff(f(x), x)=diff(f(x), x);
```

10.3
```
f(x):=log(x+sqrt(x^2+1))$ diff(f(x), x); factorfacsum(%);
```

10.4
```
g(x):=(x+2)/(1+(3*x+2)/(x+1)); diff(g(x), x)$ factor(%);
```

10.5
```
diff(3*y(x)^2+x^3=11, x); solve(%,diff(y(x) ,x));
```

10.6
```
plot2d([parametric, t*cos(t), t*sin(t)], [t,0,10])$
```

10.6
```
f(x):=abs(x-round(x))$
bl(x):=sum(1/2^k*f(2^k*x), k,0,12)$
plot2d(bl(x), [x,0,1])$
```

11.1
```
plot2d((x^3-3*x), [x,-3,3], [y,-10,10], same_xy);
```

11.2
```
plot2d(1/2*x^2/(x-1), [x,-5,5], [y,-10,10], same_xy);
```

11.3
```
plot2d(abs(x)*(x+2), [x,-2,1], same_xy);
```

11.4
```
diff((x^2+1)/x+atan(x), x);
```

11.5
```
factor(%);
```

11.6
```
solve([x^4+x^2-1=0], [x]);
```

12.1
```
taylor(%e^x,x,0,5); taylor((1+x)^(1/4), x,0,5);
```

12.2
```
taylor(log(1+x), x,0,10);
```

12.3
```
f(x):=x-x^2/2+x^3/3-x^4/4+x^5/5-x^6/6+x^7/7-x^8/8+x^9/9-
x^10/10$
f(0.5),numer;
```

12.4
```
taylor(sin(x),x,%pi/2,8);
```

13.1
```
'integrate(1/x^3,x)=integrate(1/x^3,x);
'integrate(sqrt(x),x)=integrate(sqrt(x),x);
'integrate(3*%e^x-2*cos(x),x)=
integrate(3*%e^x-2*cos(x),x);
'integrate(1/(1+4*x^2),x)=integrate(1/(1+4*x^2),x);
'integrate(1/sqrt(1-9*x^2),x)=
integrate(1/sqrt(1-9*x^2),x);
```

13.2
```
f(x):=(x+5)/(x^2+x-2);
partfrac(f(x),x);
```

13.3
```
f(x):=(x-1)/(x*(x^2+1));
partfrac(f(x),x);
```

13.4
```
f(x):=x^3/(x^2+2*x+2);
partfrac(f(x),x);
```

13.5
```
f(x):=(x^3-2x+1)/(x^3*(x^2+1));
partfrac(f(x),x);
```

13.6
```
'integrate((sin(x))^4,x)=trigsimp(integrate((sin(x))^4,x));
```

13.7
```
'integrate(1/sin(x),x)=integrate(1/sin(x),x),logabs;
```

13.8
```
'integrate(sqrt(x^2+1),x)=integrate(sqrt(x^2+1),x);
```

13.9
```
'integrate(1/sqrt(x^2+1),x)=integrate(1/sqrt(x^2+1),x);
```

13.10
```
'integrate(%e^(3*x)*sin(2*x),x)=
integrate(%e^(3*x)*sin(2*x),x);
```

13.11
```
'integrate(%e^x*sin(2*x)*cos(3*x),x)=
    trigsimp(integrate(%e^x*sin(2*x)*cos(3*x),x));
```

14.1
```
f(x):=x^2;
Riemannsumma(n):=sum(f(k/n)*1/n,k,1,n);
Riemannsumma(n),simpsum;
```

14.2
```
Riemannsumma(10);
%,numer;
Riemannsumma(100),numer;
Riemannsumma(1000),numer;
limit(Riemannsumma(n),n,inf),simpsum;
```

14.3
```
'integrate(x^2,x,0,2)=integrate(x^2,x,0,2);
```

14.4
```
'integrate(1/(x+sqrt(x)),x,1,4)=
integrate(1/(x+sqrt(x)),x,1,4);
```

14.5
```
integrate((x-1)/(x*(x^2+1)),x,1,inf);
```

16.1
```
ekv:'diff(y,t,1)=-k*y;
sol:ode2(ekv,y,t);
ic1(%,t=0,y=y0);
```

16.2
```
load(plotdf)$
plotdf(2*x*(y^2-y),[xcenter,0],[xradius,2],
[ycenter,0],[yradius,2])$
```

16.3
```
plotdf(2*x*(y^2-y),[xcenter,0],[xradius,2],
[ycenter,0],[yradius,2],[trajectory_at,0,0.5])$
```

16.4
```
assume(w>0);
ekv:'diff(y,t,2)+w^2*y=(F/m)*cos(b*t);
ode2(ekv,y,t);
```

16.5
```
assume(w>0);
ekv:'diff(y,t,2)+w^2*y=(F/m)*cos(w*t);
ode2(ekv,y,t);
```

16.6
```
assume(M>y, y>0);
ekv:'diff(y,t,1)=k*y*(M-y);
ode2(ekv,y,t),logabs;
```

16.7
```
solve(y/(M-y)=(a/(M-a))*exp(k*M*t),y);
```