```
> p:=x^2+2*x-4;
```

$$p := x^2 + 2\,x - 4$$

```
> solve(p,x);
```

$$-1 + \sqrt{5},\ -1 - \sqrt{5}$$

```
> q:=2*x^3-5*x^2+2;
```

$$q := 2\,x^3 - 5\,x^2 + 2$$

```
> nq:=solve(q=0,x);
```

$$nq := \frac{1}{6}\,(17 + 6\,I\sqrt{426}\,)^{(1/3)} + \frac{\frac{25}{6}}{(17 + 6\,I\sqrt{426}\,)^{(1/3)}} + \frac{5}{6},\ -\frac{1}{12}\,(17 + 6\,I\sqrt{426}\,)^{(1/3)}$$
$$- \frac{25}{12}\,\frac{1}{(17 + 6\,I\sqrt{426}\,)^{(1/3)}} + \frac{5}{6} + \frac{1}{2}\,I\sqrt{3}\left(\frac{1}{6}\,(17 + 6\,I\sqrt{426}\,)^{(1/3)} - \frac{25}{6}\,\frac{1}{(17 + 6\,I\sqrt{426}\,)^{(1/3)}}\right),$$
$$-\frac{1}{12}\,(17 + 6\,I\sqrt{426}\,)^{(1/3)} - \frac{25}{12}\,\frac{1}{(17 + 6\,I\sqrt{426}\,)^{(1/3)}} + \frac{5}{6}$$
$$-\frac{1}{2}\,I\sqrt{3}\left(\frac{1}{6}\,(17 + 6\,I\sqrt{426}\,)^{(1/3)} - \frac{25}{6}\,\frac{1}{(17 + 6\,I\sqrt{426}\,)^{(1/3)}}\right)$$

```
> evalc(nq[1]);
```

$$\frac{1}{6}\,125^{(1/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{1}{30}\,125^{(2/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{5}{6}$$
$$+ I\left(\frac{1}{6}\,125^{(1/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) - \frac{1}{30}\,125^{(2/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right)\right)$$

```
> simplify(%);
```

$$\frac{5}{3}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{5}{6}$$

```
> evalc(nq[2]);
```

$$-\frac{1}{12}\,125^{(1/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) - \frac{1}{60}\,125^{(2/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{5}{6}$$
$$-\frac{1}{2}\sqrt{3}\left(\frac{1}{6}\,125^{(1/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{1}{30}\,125^{(2/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right)\right) + I\Bigg($$
$$-\frac{1}{12}\,125^{(1/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) + \frac{1}{60}\,125^{(2/3)}\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right)$$
$$+\frac{1}{2}\sqrt{3}\left(\frac{1}{6}\,125^{(1/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right) - \frac{1}{30}\,125^{(2/3)}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{426}\right)\right)\right)\Bigg)$$

```
> simplify(%);
```

$$-\frac{5}{6}\cos\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{3}\sqrt{142}\right)\right) + \frac{5}{6} - \frac{5}{6}\sqrt{3}\,\sin\left(\frac{1}{3}\arctan\left(\frac{6}{17}\sqrt{3}\sqrt{142}\right)\right)$$

```
> r:=x^7-x^2-x+1;
```

$$r := x^7 - x^2 - x + 1$$

```
> solve(r=0,x);
```

-1, 1, $\mathrm{RootOf}(\_Z^5 + \_Z^3 + \_Z - 1, index = 1)$, $\mathrm{RootOf}(\_Z^5 + \_Z^3 + \_Z - 1, index = 2)$, $\mathrm{RootOf}(\_Z^5 + \_Z^3 + \_Z - 1, index = 3)$, $\mathrm{RootOf}(\_Z^5 + \_Z^3 + \_Z - 1, index = 4)$, $\mathrm{RootOf}(\_Z^5 + \_Z^3 + \_Z - 1, index = 5)$

```
> fsolve(r=0,x,complex);
```

-1., -.7077287898 − .8419548540 *I*, -.7077287898 + .8419548540 *I*, .3892873314 − 1.070675775 *I*, .3892873314 + 1.070675775 *I*, .6368829168, 1.

```
> s:=x^5-4*x^3+x+2;
```

$$s := x^5 - 4\,x^3 + x + 2$$

```
> solve(s=0,x);
```

$$1,\ -2,\ \frac{1}{3}(19+3\sqrt{33})^{(1/3)} + \frac{\frac{4}{3}}{(19+3\sqrt{33})^{(1/3)}} + \frac{1}{3},\ -\frac{1}{6}(19+3\sqrt{33})^{(1/3)} - \frac{2}{3}\frac{1}{(19+3\sqrt{33})^{(1/3)}} + \frac{1}{3} + \frac{1}{2}I\sqrt{3}\left(\frac{1}{3}(19+3\sqrt{33})^{(1/3)} - \frac{4}{3}\frac{1}{(19+3\sqrt{33})^{(1/3)}}\right),\ -\frac{1}{6}(19+3\sqrt{33})^{(1/3)} - \frac{2}{3}\frac{1}{(19+3\sqrt{33})^{(1/3)}} + \frac{1}{3} - \frac{1}{2}I\sqrt{3}\left(\frac{1}{3}(19+3\sqrt{33})^{(1/3)} - \frac{4}{3}\frac{1}{(19+3\sqrt{33})^{(1/3)}}\right)$$

```
> fsolve(s=0,x,complex);
```

-2., -.4196433776 − .6062907292 *I*, -.4196433776 + .6062907292 *I*, 1., 1.839286755

```
>
> sol1:=solve(sqrt(x)+1=3*x-x^2,x);
```

$$sol1 := -\frac{1}{12}(28+84\,I\sqrt{3})^{(1/3)} - \frac{7}{3}\frac{1}{(28+84\,I\sqrt{3})^{(1/3)}} + \frac{5}{3} - \frac{1}{2}I\sqrt{3}\left(\frac{1}{6}(28+84\,I\sqrt{3})^{(1/3)} - \frac{14}{3}\frac{1}{(28+84\,I\sqrt{3})^{(1/3)}}\right),\ 1$$

```
> evalf(%);
```

$$1.554958133 - .1339745960\ 10^{-10}\,I,\ 1.$$

```
> evalc(sol1[1]);
```

$$-\frac{1}{12}56^{(1/3)}7^{(1/6)}\cos\left(\frac{1}{3}\arctan(3\sqrt{3})\right) - \frac{1}{168}56^{(2/3)}7^{(5/6)}\cos\left(\frac{1}{3}\arctan(3\sqrt{3})\right) + \frac{5}{3} + \frac{1}{2}\sqrt{3}\left(\frac{1}{6}56^{(1/3)}7^{(1/6)}\sin\left(\frac{1}{3}\arctan(3\sqrt{3})\right) + \frac{1}{84}56^{(2/3)}7^{(5/6)}\sin\left(\frac{1}{3}\arctan(3\sqrt{3})\right)\right) + I\left(-\frac{1}{12}56^{(1/3)}7^{(1/6)}\sin\left(\frac{1}{3}\arctan(3\sqrt{3})\right) + \frac{1}{168}56^{(2/3)}7^{(5/6)}\sin\left(\frac{1}{3}\arctan(3\sqrt{3})\right)\right)$$

$$-\frac{1}{2}\sqrt{3}\left(\frac{1}{6}56^{(1/3)}7^{(1/6)}\cos\left(\frac{1}{3}\arctan(3\sqrt{3})\right)-\frac{1}{84}56^{(2/3)}7^{(5/6)}\cos\left(\frac{1}{3}\arctan(3\sqrt{3})\right)\right)\Bigg)\Bigg)$$

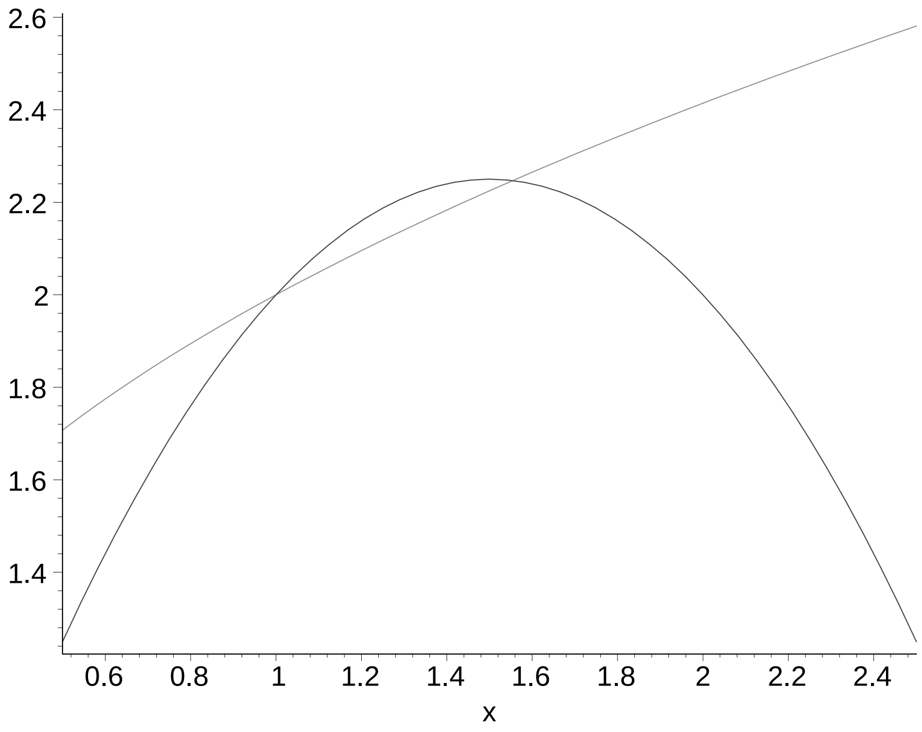
```
> simplify(%);
```

$$-\frac{1}{3}\sqrt{7}\cos\left(\frac{1}{3}\arctan(3\sqrt{3})\right)+\frac{5}{3}+\frac{1}{3}\sqrt{3}\sqrt{7}\sin\left(\frac{1}{3}\arctan(3\sqrt{3})\right)$$

```
> evalf(%);
```

$$1.554958132$$

```
> plot({sqrt(x)+1,3*x-x^2},x=0.5..2.5);
```



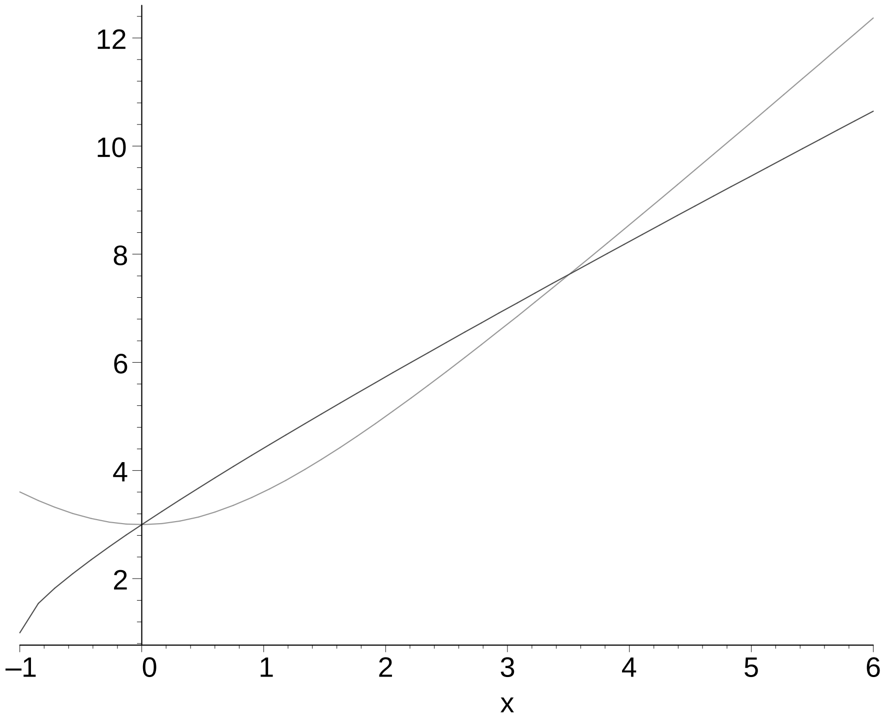

```
>
> solve(sqrt(x+1)+x+2<sqrt(9+4*x^2),{x});
```

$$\{-1 \le x, x < 0\}, \left\{-1+\left(\frac{1}{9}(1322+9\sqrt{12273})^{(1/3)}+\frac{\frac{91}{9}}{(1322+9\sqrt{12273})^{(1/3)}}-\frac{1}{9}\right)^2 < x\right\}$$

```
> evalf(%);
```

$$\{-1. \le x, x < 0.\}, \{3.509198148 < x\}$$

```
> plot({sqrt(x+1)+x+2,sqrt(9+4*x^2)},x=-1..6);
```




```
>
> gl1:=x+y+z=4;
```

$$gl1 := x + y + z = 4$$

```
> gl2:=x-z^2+1=0;
```

$$gl2 := x - z^2 + 1 = 0$$

```
> gl3:=x-2*y^2+z=2;
```

$$gl3 := x - 2\,y^2 + z = 2$$

```
> solve({gl1,gl2,gl3},{x,y,z});
```

$$\{y = -\mathrm{RootOf}(2\,\_Z^2 + 53 - 21\,\_Z, label = \_L7) + 5,$$
$$z = \mathrm{RootOf}(-\mathrm{RootOf}(2\,\_Z^2 + 53 - 21\,\_Z, label = \_L7) + \_Z + \_Z^2), x =$$
$$\mathrm{RootOf}(2\,\_Z^2 + 53 - 21\,\_Z, label = \_L7)$$
$$- \mathrm{RootOf}(-\mathrm{RootOf}(2\,\_Z^2 + 53 - 21\,\_Z, label = \_L7) + \_Z + \_Z^2) - 1\}$$

```
> allvalues(%);
```

$$\{x = \frac{19}{4} + \frac{1}{4}\sqrt{17} - \frac{1}{2}\sqrt{22+\sqrt{17}}, z = -\frac{1}{2} + \frac{1}{2}\sqrt{22+\sqrt{17}}, y = -\frac{1}{4} - \frac{1}{4}\sqrt{17}\},$$
$$\{x = \frac{19}{4} + \frac{1}{4}\sqrt{17} + \frac{1}{2}\sqrt{22+\sqrt{17}}, z = -\frac{1}{2} - \frac{1}{2}\sqrt{22+\sqrt{17}}, y = -\frac{1}{4} - \frac{1}{4}\sqrt{17}\},$$
$$\{y = -\frac{1}{4} + \frac{1}{4}\sqrt{17}, z = -\frac{1}{2} + \frac{1}{2}\sqrt{22-\sqrt{17}}, x = \frac{19}{4} - \frac{1}{4}\sqrt{17} - \frac{1}{2}\sqrt{22-\sqrt{17}}\},$$

$$\{y=-\frac{1}{4}+\frac{1}{4}\sqrt{17},\ z=-\frac{1}{2}-\frac{1}{2}\sqrt{22-\sqrt{17}},\ x=\frac{19}{4}-\frac{1}{4}\sqrt{17}+\frac{1}{2}\sqrt{22-\sqrt{17}}\ \}$$

```
> evalf(%);
```

$\{z=2.055538379,\ x=3.225238027,\ y=-1.280776406\},$

$\{z=-3.055538379,\ y=-1.280776406,\ x=8.336314785\},$

$\{z=1.614053829,\ y=.7807764060,\ x=1.605169765\},$

$\{y=.7807764060,\ x=5.833277423,\ z=-2.614053829\}$

```
>
> null1:=solve(cos(x)+Pi/x,x);
```

$$null1 := \mathrm{RootOf}(\_Z\cos(\_Z)+\pi)$$

```
> null1:=fsolve(cos(x)+Pi/x,x);
```

$$null1 := 3.141592654$$

```
> null2:=fsolve(cos(x)+Pi/x,x,avoid={x=null1});
```

$$null2 := 10.69750490$$

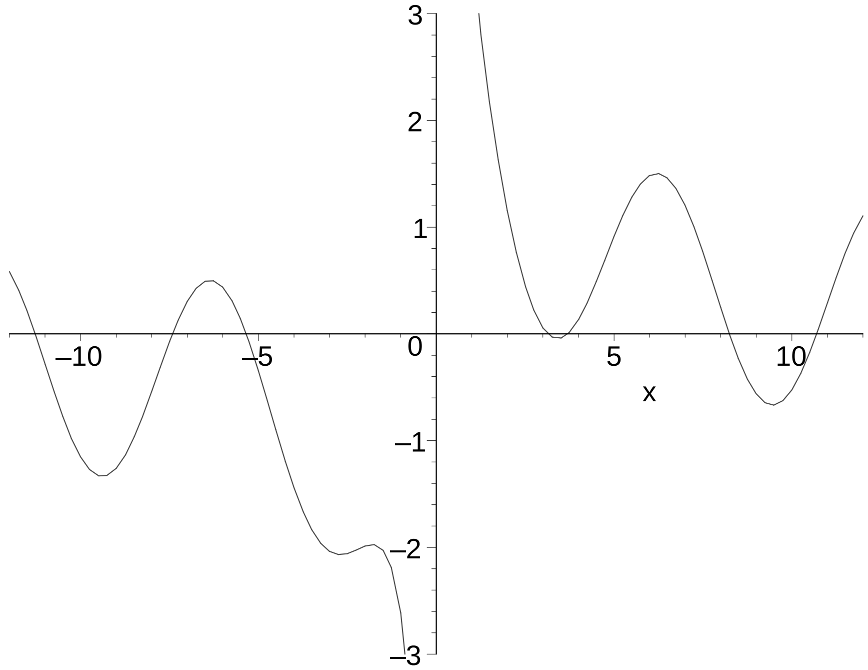
```
> fsolve(cos(x)+Pi/x,x,avoid={x=null1,x=null2});
```

$$-11.27787138$$

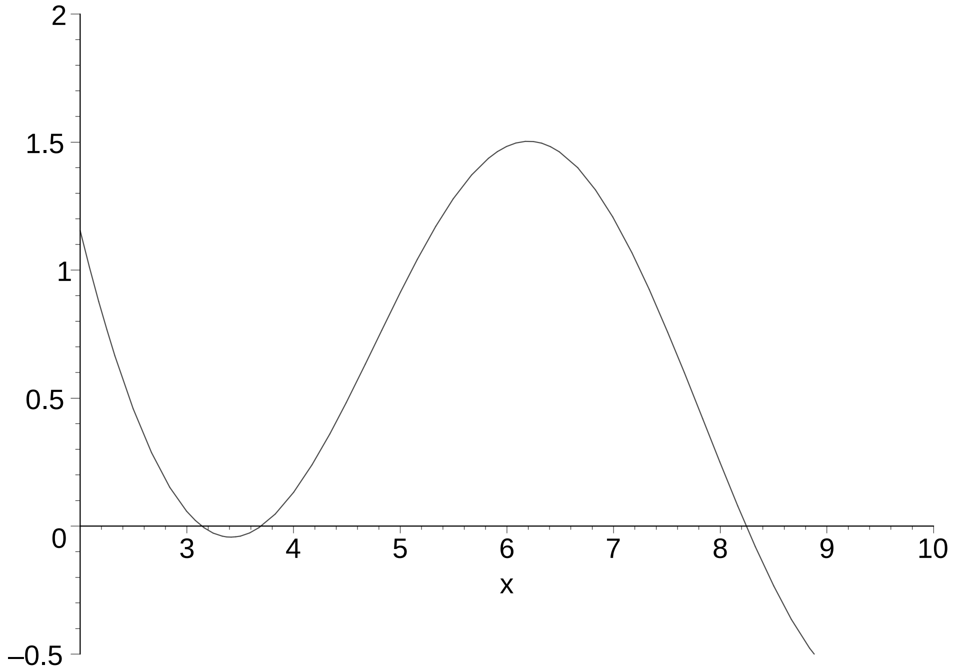
```
> fsolve(cos(x)+Pi/x,x=0..10);
```

$$3.696722923$$

```
> plot(cos(x)+Pi/x,x=-12..12,-3..3,discont=true);
```

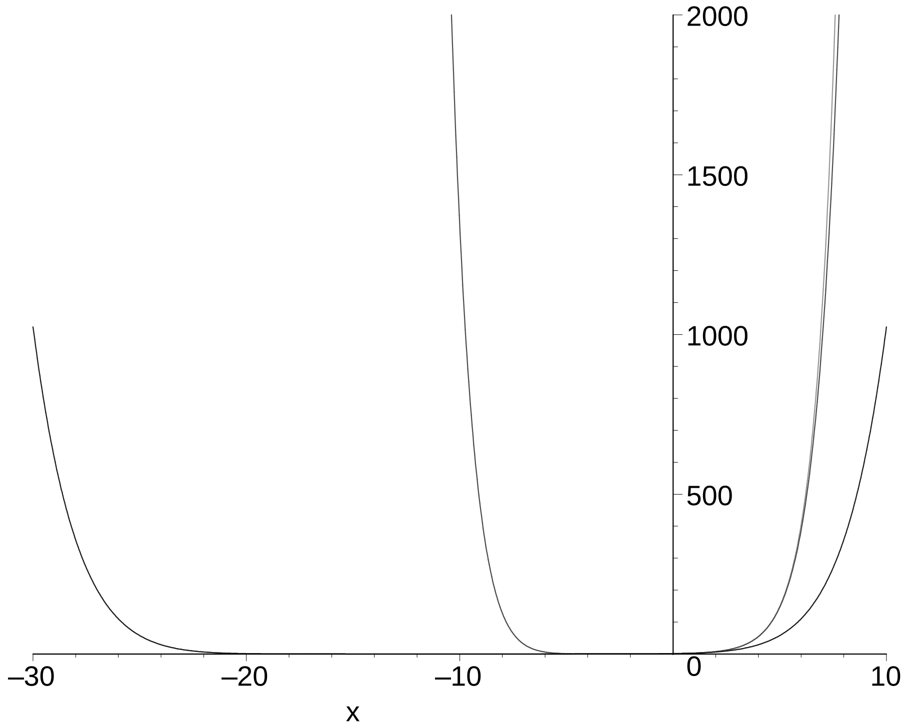



```
> plot(cos(x)+Pi/x,x=2..10,-0.5..2);
```

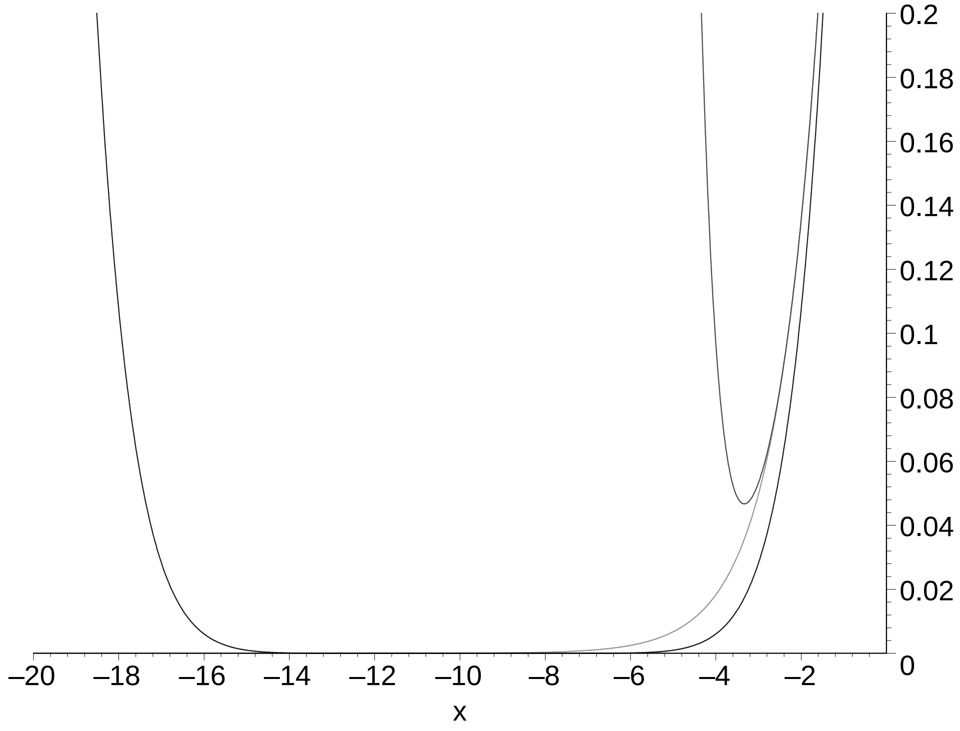


>

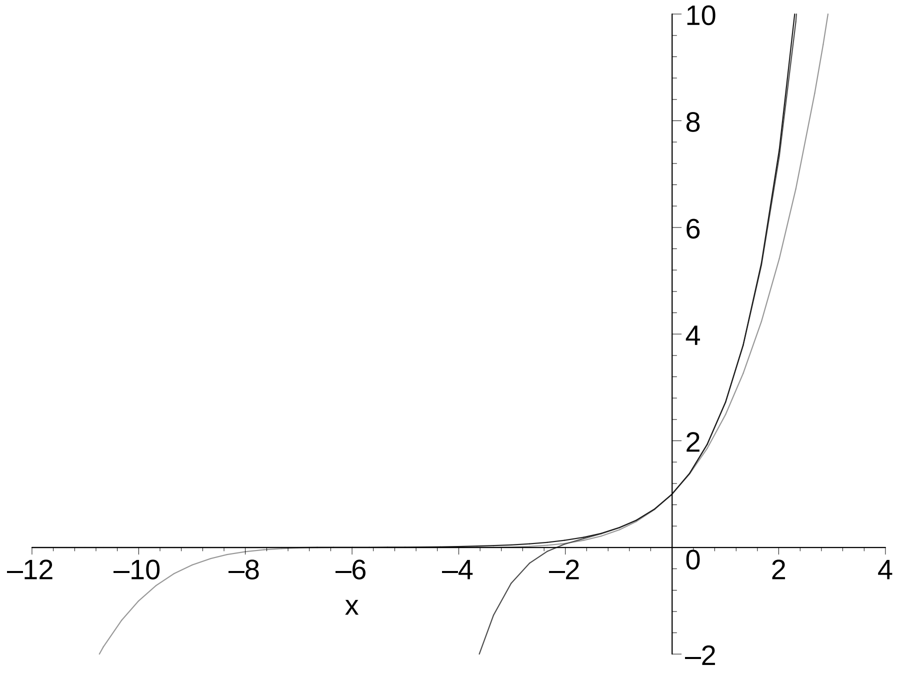
```
> plot({exp(x),sum(x^k/k!,k=0..10),(1+x/10)^10},x=-30..10,-2..2000,c
  olor=[blue,red,green],numpoints=1000);
```



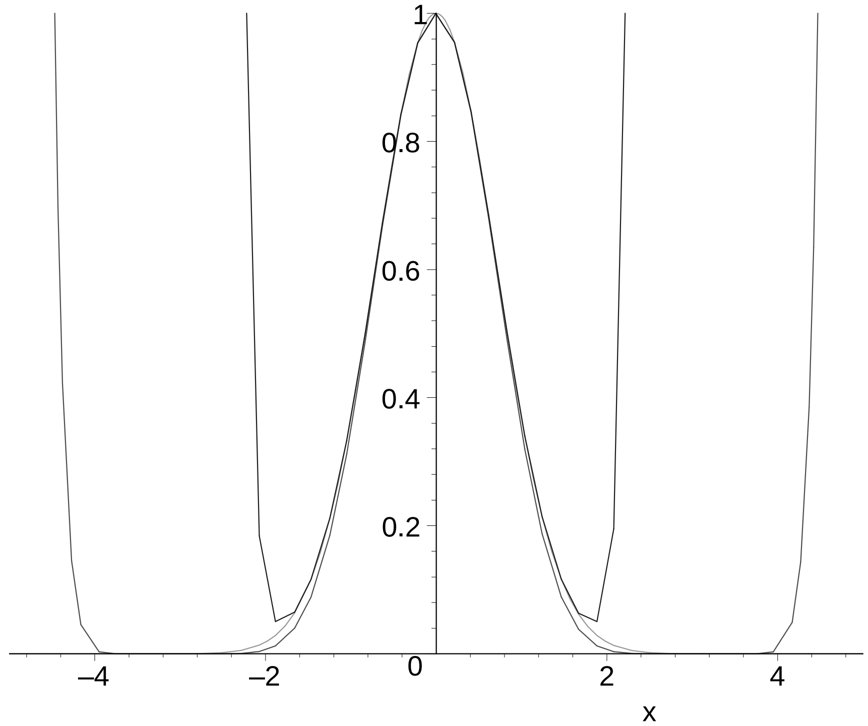
```
> plot({exp(x),sum(x^k/k!,k=0..10),(1+x/10)^10},x=-20..0,0..0.2,colo
  r=[blue,red,green],numpoints=1000);
```




```
> plot({exp(x),sum(x^k/k!,k=0..5),(1+x/5)^5},x=-12..4,-2..10,color=[
  blue,red,green]);
```

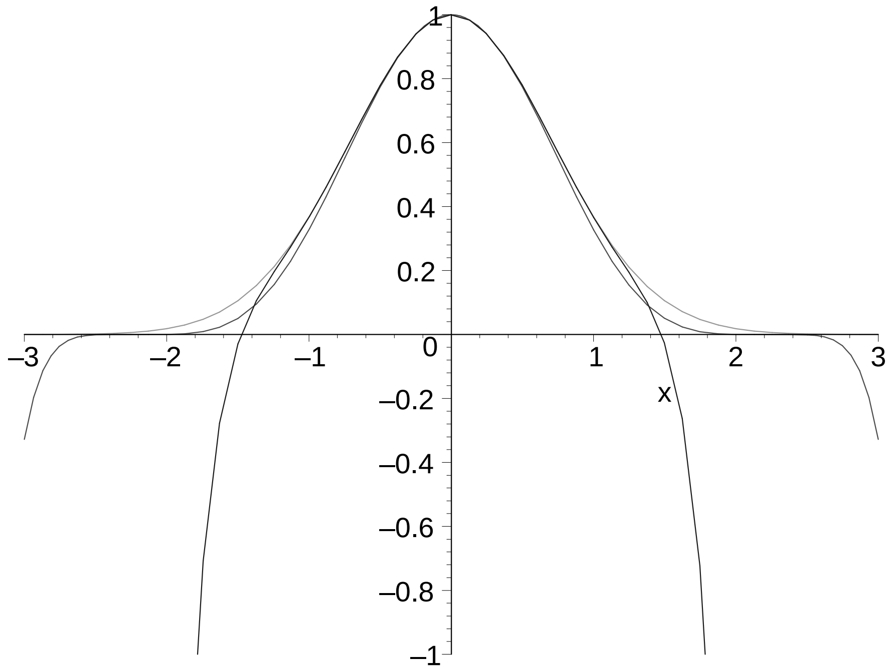



```
> plot({exp(-x^2),sum((-x^2)^k/k!,k=0..10),(1+(-x^2)/10)^10},x=-5..5
  ,0..1,color=[blue,red,green]);
```

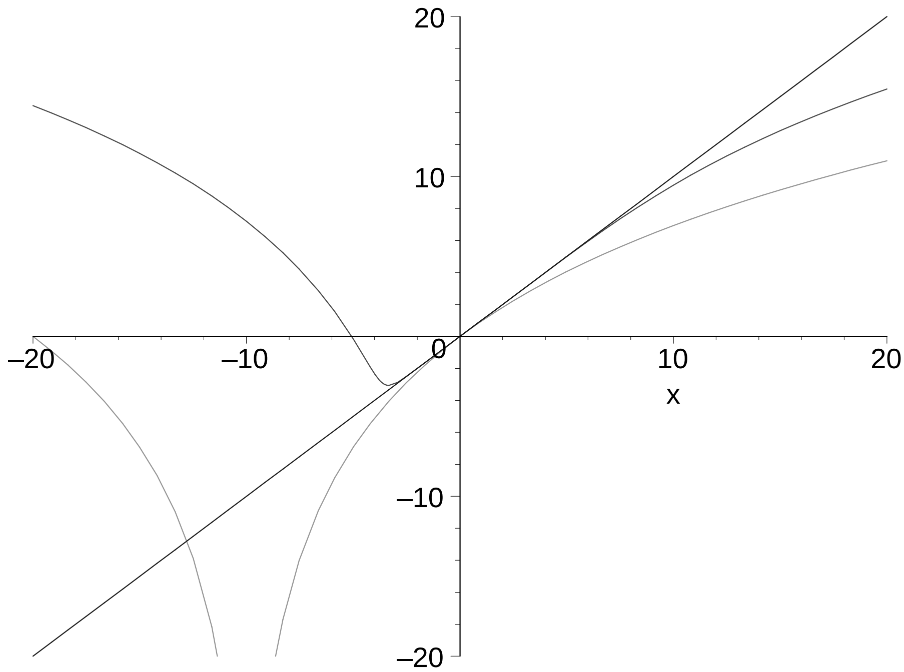



```
> plot({exp(-x^2),sum((-x^2)^k/k!,k=0..5),(1+(-x^2)/5)^5},x=-3..3,-1
```

```
..1,color=[blue,red,green]);
```




```
> plot({x,log(sum(x^k/k!,k=0..10)),log((1+x/10)^10)},x=-20..20,-20..
  20,color=[blue,red,green]);
```



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