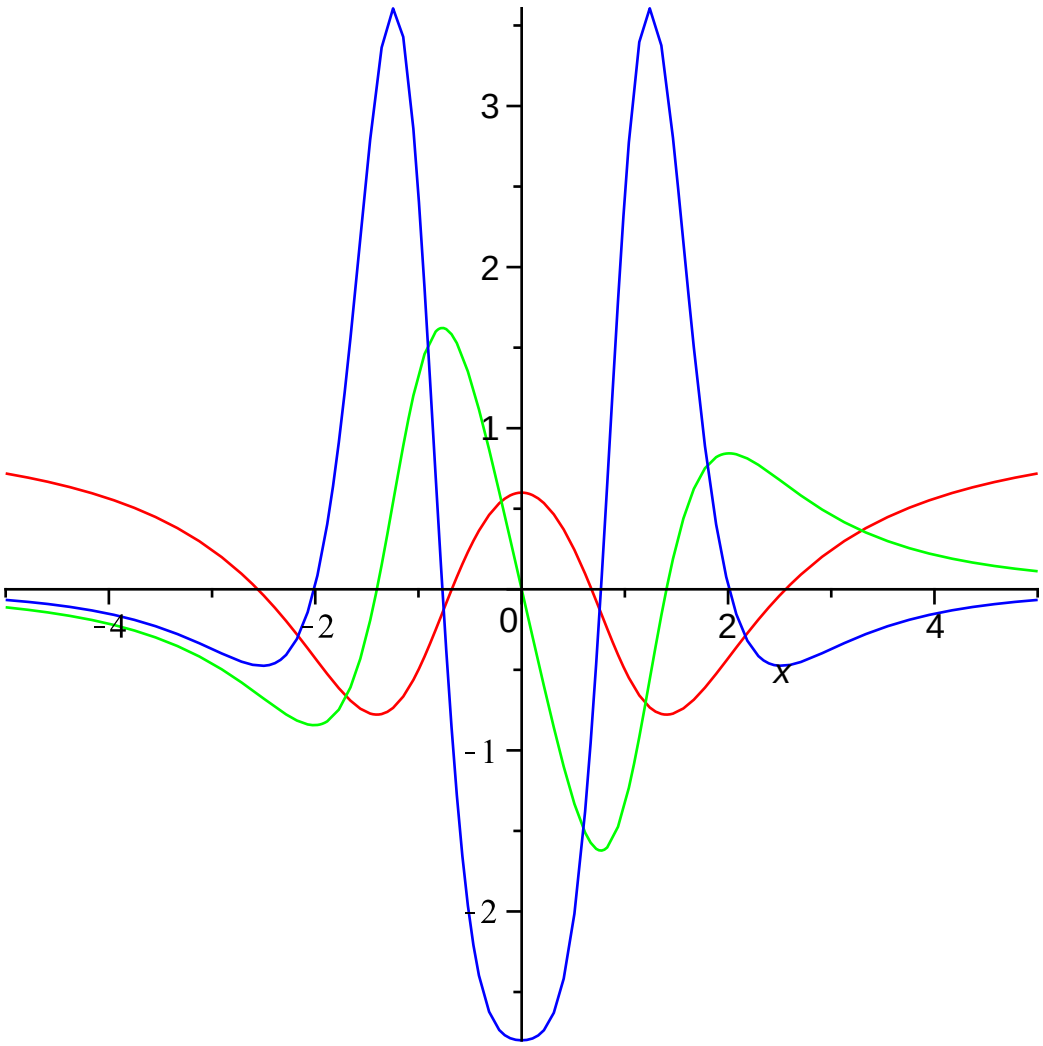
```
> restart:
> f := (x^4-7*x^2+3)/(x^4+5);
```

$$f := \frac{x^4 - 7x^2 + 3}{x^4 + 5} \tag{1}$$

```
> plot([f,diff(f,x),diff(f,x$2)],x=-5..5,color=[red,green,blue]);
```




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

$$-\frac{1}{2}\sqrt{14+2\sqrt{37}},\ \frac{1}{2}\sqrt{14+2\sqrt{37}},\ -\frac{1}{2}\sqrt{14-2\sqrt{37}},\ \frac{1}{2}\sqrt{14-2\sqrt{37}} \tag{2}$$

```
> extrem:=evalc([solve(diff(f,x)=0,x)]);
```

$$extrem := \left[0,\ -\frac{1}{7}\sqrt{-14+7\sqrt{249}},\ \frac{1}{7}\sqrt{-14+7\sqrt{249}},\ -\frac{1}{7}I\sqrt{14+7\sqrt{249}},\ \frac{1}{7}I\sqrt{14+7\sqrt{249}}\right] \tag{3}$$

```
> for x0 in extrem do
    if type(x0,realcons) then
      print(evalf(subs(x=x0,diff(f,x$2))));
```

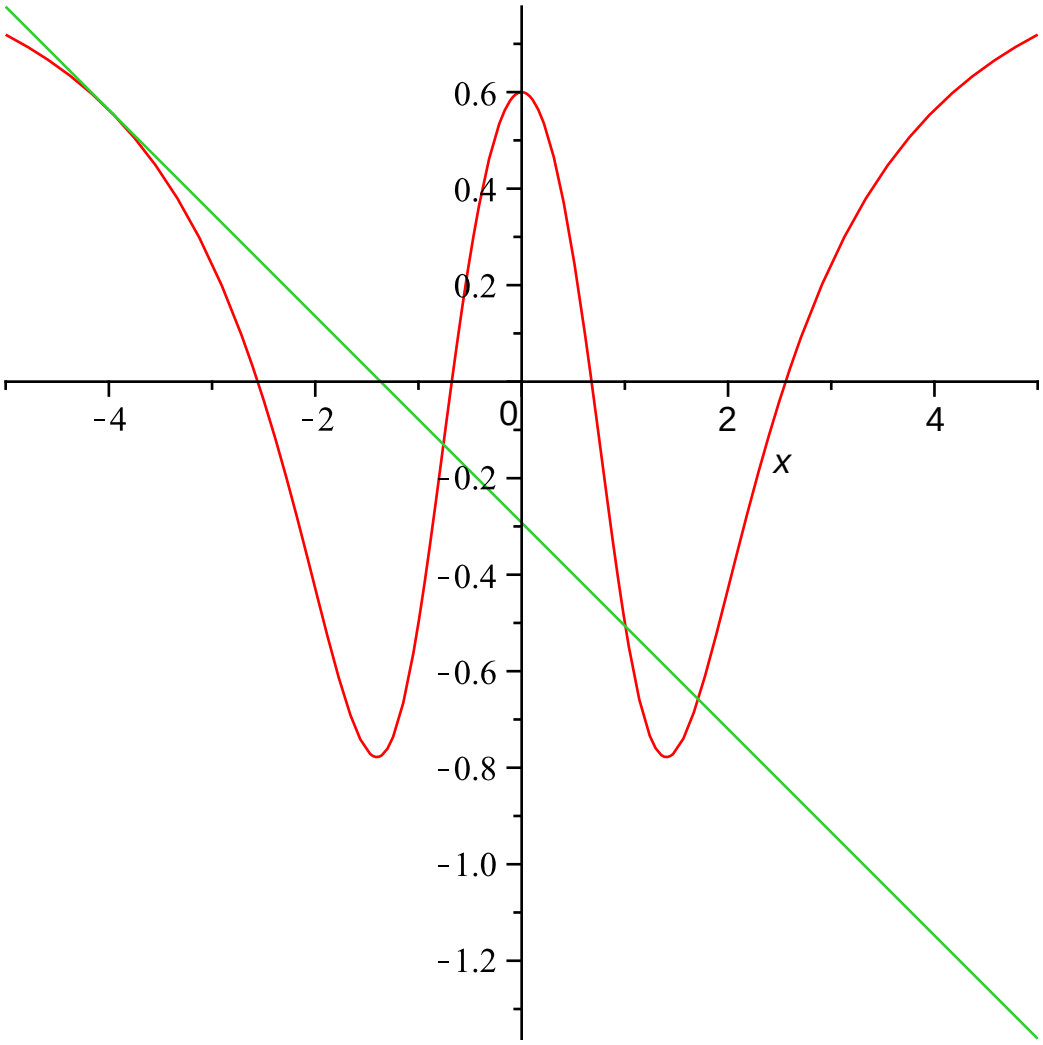
```
    fi;
  od;
```

$$-2.800000000$$
$$3.154885578$$
$$3.154885578 \quad (4)$$

```
> # Maximum bei extrem[1]
  # Minima bei extrem[2] und extrem[3]
> h:= subs(x=-4,f) + (x+4)*subs(x=-4,diff(f,x)); # Tangente
```

$$h := -\frac{6635}{22707} - \frac{4856}{22707}\,x \quad (5)$$

```
> plot([f,h],x=-5..5);
```




```
> s:=simplify(evalc([solve(f=h,x)])):
> sn:=evalf(s);
```

$$sn := [1.710301972, -0.7581653924, 1.005441674, -4., -4.] \quad (6)$$

```
> seq([k, subs(x=k,f)],k in sn); # Koordinaten der Schnittpunkte
```

$$[1.710301972, -0.6579568586], [-0.7581653924, -0.1300633652], [1.005441674, -0.5072191297], [-4., 0.5632183908], [-4., 0.5632183908] \quad (7)$$