In [1]:

```
var('x')
n(x)=x^4-4*x^2+6*x+6
show(n)
```

Out[1]:

$$x \mapsto x^4 - 4\,x^2 + 6\,x + 6$$

In [2]:

```
d(x)=x^2+x-2
show(d)
```

Out[2]:

$$x \mapsto x^2 + x - 2$$

In [3]:

```
longdivision=n.maxima_methods().divide(d)
show(longdivision)
```

Out[3]:

$$\left[x^2 - x - 1, 5\,x + 4\right]$$

In [4]:

```
q(x)=longdivision[0]
show(q)
```

Out[4]:

$$x \mapsto x^2 - x - 1$$

In [5]:

```
r(x)=longdivision[1]
show(r)
```

Out[5]:

$$x \mapsto 5\,x + 4$$

In [6]:

```
#check to see if g(x)*q(x)+r(x)=f(x)
show(expand(d*q)+r)
```

Out[6]:

$$x \mapsto x^4 - 4\,x^2 + 6\,x + 6$$

In [7]:

```
g=r/d
show(g)
```

Out[7]:

$$x \mapsto \frac{5\,x + 4}{x^2 + x - 2}$$

In [8]:

```
show(g.partial_fraction())
```

Out[8]:

$$x \mapsto \frac{2}{x + 2} + \frac{3}{x - 1}$$

In [9]:

```
show(integrate(q+g.partial_fraction(),x))
```

Out[9]:

$$x \mapsto \frac{1}{3}\,x^3 - \frac{1}{2}\,x^2 - x + 2\,\log(x + 2) + 3\,\log(x - 1)$$

In [10]:

```
#double check
show(integrate(n/d,x))
```

Out[10]:

$$x \mapsto \frac{1}{3}\,x^3 - \frac{1}{2}\,x^2 - x + 2\,\log(x + 2) + 3\,\log(x - 1)$$

In [0]:

```

```