

EXAMPLE FILE FOR M2INTEX

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1. INTRODUCTION

some basic examples:

```
i1 : R=QQ[x,y]; factor(x^3-y^3)
o2 = (x - y) (x^2 + x y + y^2)
o2 : Expression of class Product
i3 : res coker vars R
o3 = 
$$R^1 \xleftarrow{\begin{pmatrix} x & y \end{pmatrix}} R^2 \xleftarrow{\begin{pmatrix} -y \\ x \end{pmatrix}} R^1 \xleftarrow{0} 0$$

      0          1          2          3
o3 : ChainComplex
i4 : OO_(Proj(R/(x^3-y^3)))^{1,2}
o4 = 
$$\mathcal{O}_{\text{Proj}\left(\frac{R}{x^3-y^3}\right)}^1(1) \oplus \mathcal{O}_{\text{Proj}\left(\frac{R}{x^3-y^3}\right)}^1(2)$$

o4 : coherent sheaf on Proj  $\left(\frac{R}{x^3-y^3}\right)$ , free
```

more:

```
i5 : 318/46
o5 =  $\frac{159}{23}$ 
o5 :  $\mathbb{Q}$ 
i6 : exp 3.73767
o6 = 42
o6 :  $\mathbb{R}$  (of precision 53)
```

strings:

```
i7 : "hehe"
o7 = hehe
```

and nets:

```
i8 : "haha123456789" || "hoho!@#\$%^&*("
o8 = haha123456789
      hoho!@#\$%^&* (
```

printing:

```
i9 : for i from 1 to 8 do print(i^i)
1
4
27
256
3125
```

```

46656
823543
16777216

```

2. HELP

```

i10 : help det
o10 =

```

determinant – determinant of a matrix

Synopsis

- Usage:
det M
- Inputs:
-- M, a square matrix
- Optional inputs:
-- Strategy => ..., default value null, choose between Bareiss and Cofactor algorithms
- Outputs:
-- a ring element, which is the determinant of M

Description

See also

- exteriorPower -- exterior power
- minors -- ideal generated by minors
- permanents -- ideal generated by square permanents of a matrix
- pfaffians -- ideal generated by Pfaffians

Ways to use determinant :

- "determinant(Matrix)"
- "determinant(MutableMatrix)"

For the programmer

The object determinant is a method function with options.

```

o10 : DIV

```

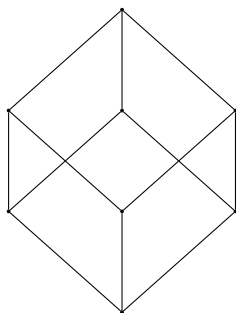
3. PACKAGES

packages that have a tex output will work:

```

i11 : needsPackage "Posets";
i12 : booleanLattice 3

```



```

o12 =
o12 : Poset

```

4. TRICKY EXAMPLES

```

i13 : -- some tricky examples

```

A bunch of complicated cases: a multi-line example

```

      f = i -> (
      -- that's dumb
      i+1
      )
o13 = f
o13 : FunctionClosure

```

and another weirder one:

```

i14 : I=ideal 0; f = i -> (
o14 : Ideal of  $\mathbb{Z}$ 
      i+1)
o15 = f
o15 : FunctionClosure

```

finally:

```

i16 : a=1;b=2;
i18 : c=3;

```

That last one has no output.