

# Multinomial Division Procedure

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HERE IT IS! So, there's a typo in the textbook. Where it says *If  $LT(f_i)$  divides  $(p)$*  it should say *If  $LT(f_i)$  divides  $LT(p)$* . Note that this silly typo caused me to be in the computer lab until 7:30 last night. But, it was SO WORTH IT when it finally ran. It's a joy you quitters will never experience. ;)

Without further ado, here is the procedure:

```
MULTIDIV := proc(f,divisors,variables,weights)
local a, r, i, p, divisionoccurred;
a := array(1..nops(divisors));
i := 1;
while i < nops(divisors)+1
do
a[i] := 0;
i := i+1;
od;
r := 0;
p := f;
while p <> 0
do
i := 1;
divisionoccurred := false;
while i < nops(divisors)+1 and divisionoccurred = false
do
if divide(LT(p,variables,weights),LT(divisors[i],variables,weights))
then
a[i] :=
```

```

expand(simplify(a[i] +
LT(p,variables,weights)/LT(divisors[i],variables,weights)));
p :=
expand(simplify(p -
(LT(p,variables,weights)/LT(divisors[i],variables,weights))
*divisors[i]));
divisionoccurred := true;
else
i := i+1;
fi;
od;
if divisionoccurred = false
then
r := expand(simplify(r + LT(p,variables,weights)));
p := expand(simplify(p - LT(p,variables,weights)));
fi;
od;
[eval(a),r];
end;

```