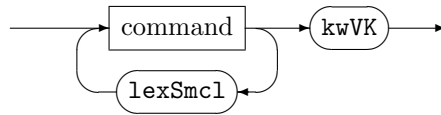*rules*

directiveLine

program
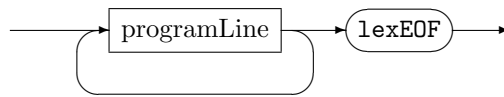
directiveLine

command

lexSmcl

kwVK

program

programLine

lexEOF

programLine

lineNum

command

lexSmcl

kwVK

lineNum

grpNum

lexPeriod

lexInt

grpNum

lexInt

command

```
set
ask
type
write
goto
if
for
quit
do
return
comment
erase
modify
xecute
```

set

S → ET → var → lexEQ → expr

var

lexId → lexLftBr → indExpr → lexComma → indExpr → lexRghBr

indExpr

```
          ┌─────────┐
  ────────┤  lexInt ├────────────►
          └─────────┘
          ┌───────┐
          │  var  │
          └───────┘
          ┌───────┐
          │ expr  │
          └───────┘
```

expr

```
      ┌─────────┐
  ────┤ addExpr ├────►
      └─────────┘
```

addExpr

```
   ┌─────────┐
  ─┤ mulExpr ├───────────────────────────────────►
   └─────────┘
              ┌──────────┐    ┌─────────┐
              │ lexPlus  │    │ mulExpr │
              └──────────┘    └─────────┘
              ┌──────────┐
              │ lexMinus │
              └──────────┘
```

mulExpr

```
   ┌─────────┐
  ─┤ powExpr ├───────────────────────────────────►
   └─────────┘
              ┌────────┐    ┌─────────┐
              │ lexMul │    │ powExpr │
              └────────┘    └─────────┘
              ┌────────┐
              │ lexDiv │
              └────────┘
```
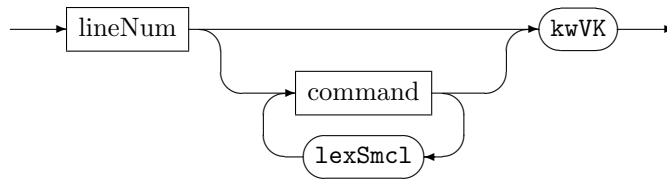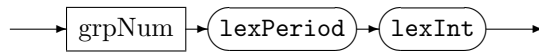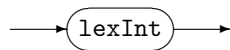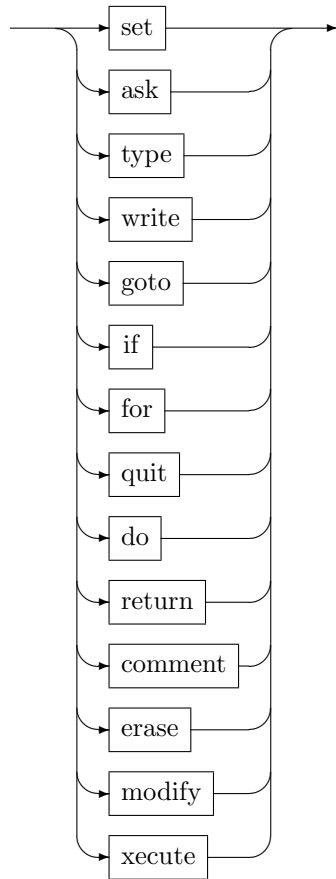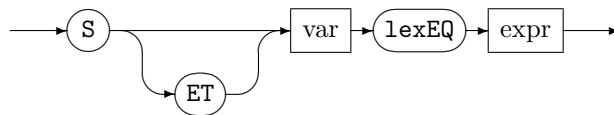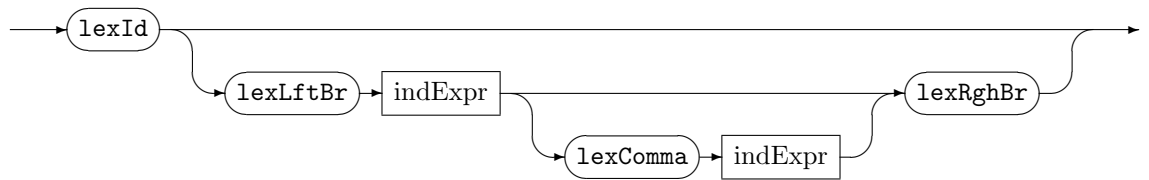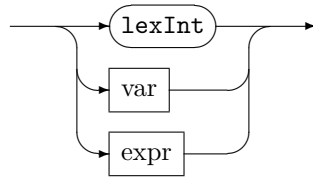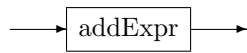
powExpr
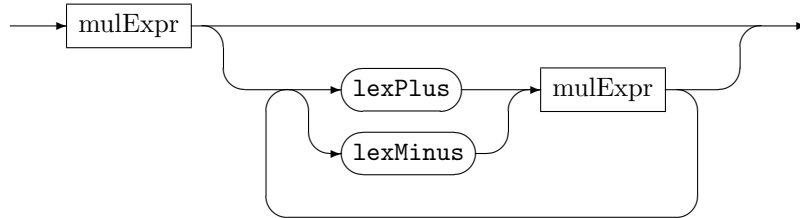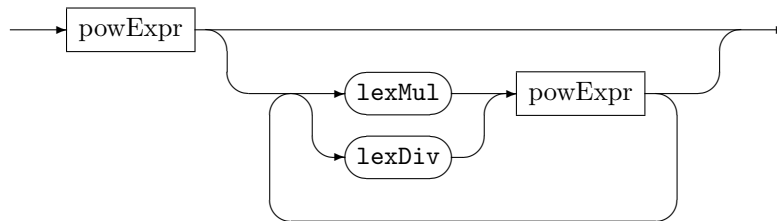
```
   ┌───────────┐
  ─┤ unaryExpr ├───────────────────────────────►
   └───────────┘
              ┌──────────┐    ┌───────────┐
              │ lexCaret │    │ unaryExpr │
              └──────────┘    └───────────┘
```

unaryExpr

```
  ───────────────────────┬───────────────┐ ┌─────────────┐
                          │               ├─┤ primaryExpr ├──►
              ┌──────────┐                   └─────────────┘
              │ lexPlus  │
              └──────────┘
              ┌──────────┐
              │ lexMinus │
              └──────────┘
```

3

primaryExpr
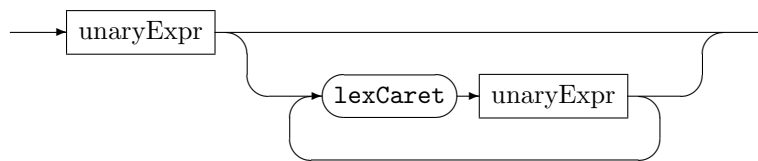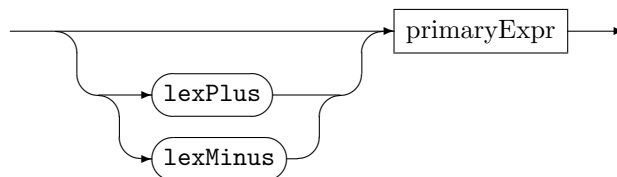
```
─────┬──→( lexReal )──────────────────────┬──→
     │                                     │
     └──→[ var ]──────────────────────────┤
     │                                     │
     └──→[ function ]─────────────────────┤
     │                                     │
     └──→( lexLftBr )──→[ expr ]──→( lexRghBr )
```

function

```
──→[ nameFunction ]──→( lexLftBr )──┬────────────────────┬──→( lexRghBr )──→
                                    │   ┌──→[ expr ]──┐   │
                                    └───┤             ├───┘
                                        └←(lexComma)←─┘
```

nameFunction

```
─────┬──→( kwFABS )──────┬──→
     ├──→( kwFCHR )──────┤
     ├──→( kwFCOS )──────┤
     ├──→( kwFITR )──────┤
     ├──→( kwFLOG )──────┤
     ├──→( kwFRAN )──────┤
     ├──→( kwFSBR )──────┤
     ├──→( kwFSGN )──────┤
     ├──→( kwFSQT )──────┤
     ├──→( kwFSIN )──────┤
     └──→( kwFX )────────┘
```
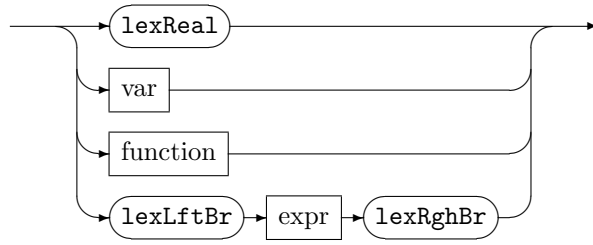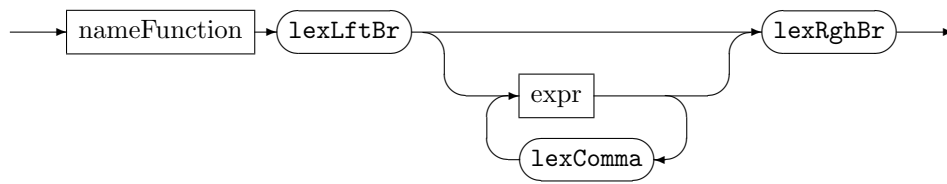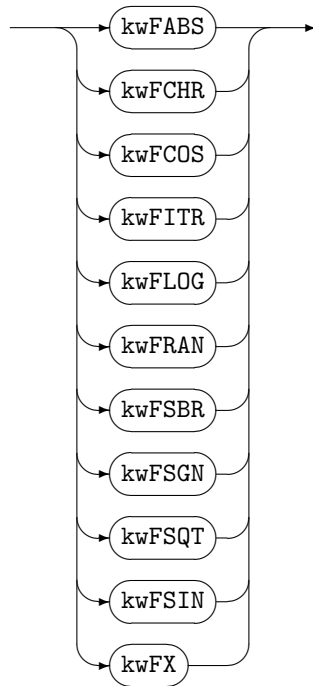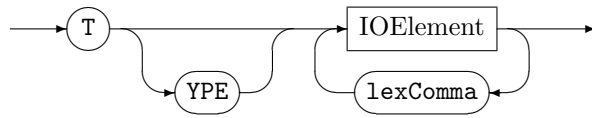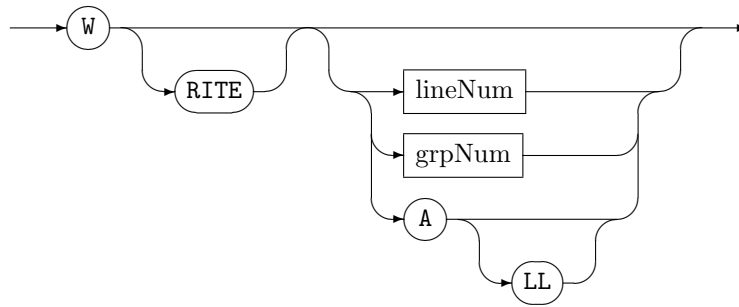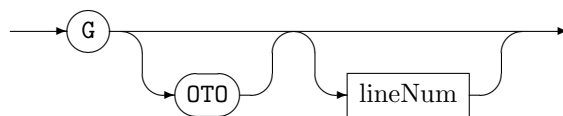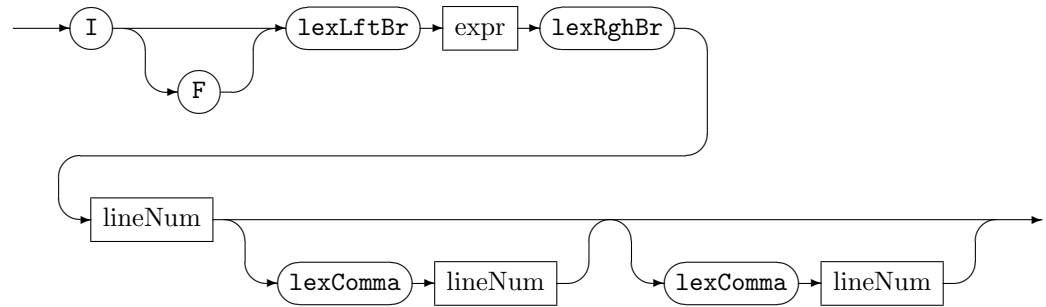
ask
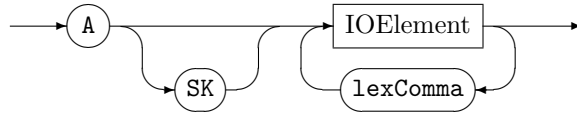
IOElement

type

write

goto

if

```
────→(I)──┬──────────────┬──→[lexLftBr]→[expr]→(lexRghBr)─┐
          └──(F)──┘                                        │
                                                           │
   ┌───────────────────────────────────────────────────────┘
   │
   └──[lineNum]──┬──────────────────────────────┬──────────────────────────────┬──→
                 └─(lexComma)→[lineNum]─┘        └─(lexComma)→[lineNum]─┘
```

for

```
────→(F)──┬──────────┬──→[var]→(lexEQ)─┐
          └──(OR)──┘                    │
                                        │
   ┌─────────────────────────────────────┘
   │
   └──[expr]──┬───────────────────────┬──┬───────────────────────┬──┐
             └─(lexComma)→[expr]─┘     └─(lexComma)→[expr]─┘        │
   ┌──────────────────────────────────────────────────────────────┘
   │
   └──(lexSmcl)──┬──────────────────────┬──→
                └──[command]──┘
```
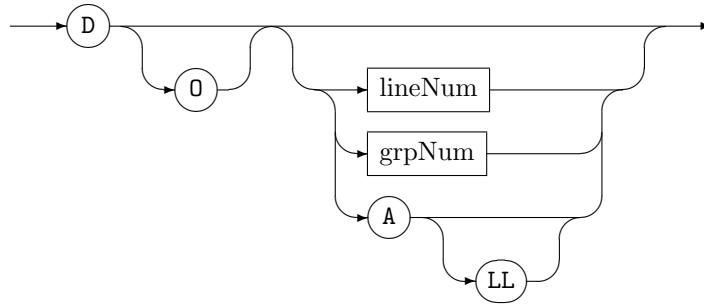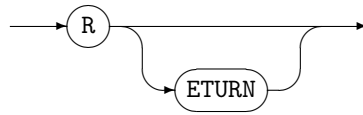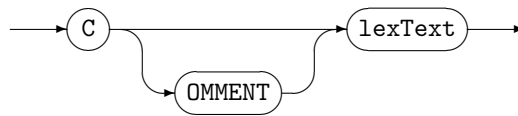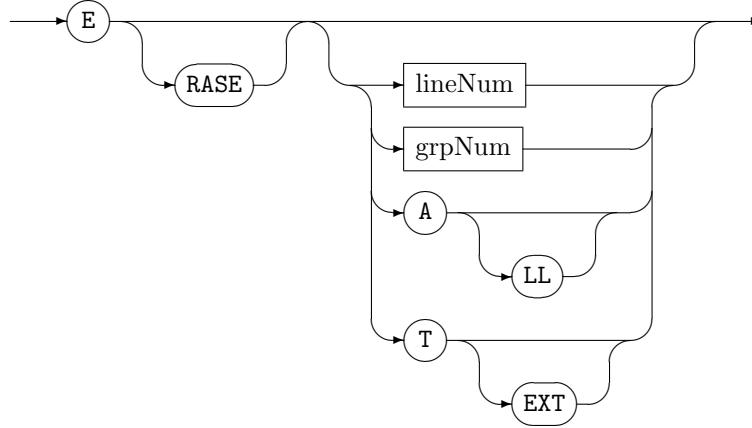
quit

```
────→(Q)──┬──────────┬──→
          └──(UIT)──┘
```

6

do

return

comment

erase

modify

xecute