

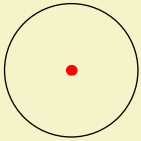


narysuj mi baranka!

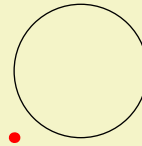
I) Podstawowe operacje
Basic operation

Podstawowe kształty
Basic shapes

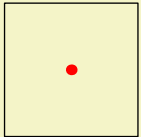
fullcircle



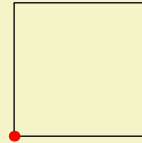
unitcircle



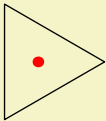
fullsquare



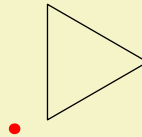
unitsquare



fulltriangle



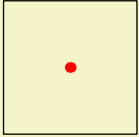
unittriangle



skalowanie scaling

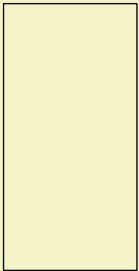
scaled

```
draw fullsquare scaled 50;  
drawdot origin withcolor red  
  withpen pencircle scaled 4;
```



yscaled

```
path p;  
p:= fullsquare scaled 50;  
draw p yscaled 2;
```



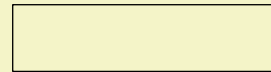
xscaled

```
path p;  
p:= fullsquare scaled 50;  
draw p xscaled 2;
```



xyscaled

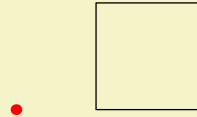
```
path p;  
p:= fullsquare scaled 50;  
draw p xyscaled (2,0.5);
```



przesunięcie
shifting

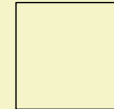
xshifted

```
drawdot origin withcolor red  
  withpen pencircle scaled 4;  
draw unitsquare scaled 40 xshifted 30;
```



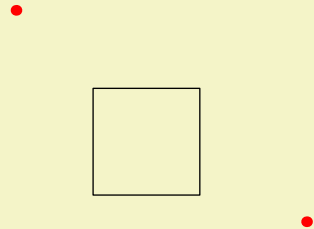
yshifted

```
drawdot origin withcolor red  
  withpen pencircle scaled 4;  
draw unitsquare scaled 40 yshifted 30;
```



shifted

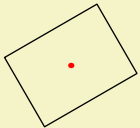
```
drawdot origin withcolor red  
  withpen pencircle scaled 4;  
draw unitsquare scaled 40 shifted  
(-80,10);
```



obrót rotation

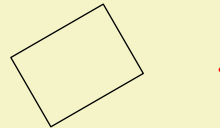
rotated

```
% jednostka; unit
numeric u; u:=2;
drawdot origin withcolor red
  withpen pencircle scaled 2;
path p;
p:= fullsquare xyscaled (20u,15u);
draw p rotated 15u;
```



rotatedaround

```
drawdot origin withcolor red
  withpen pencircle scaled 2;
path p;
p:= fullsquare xyscaled (40,30);
draw p rotatedaround ((-30,-100),30);
```



Odbicie lustrzane Symetry(?) Reflection(?)

```
reflectedabout  
drawdot origin withcolor red  
  withpen pencircle scaled 2;  
path p[];  
p:= fullcircle xyscaled (20,30)  
  xshifted 40u;  
draw p;  
draw p reflectedabout (origin,(0,10));
```



składnia syntax

```
% jednostka; unit
numeric u; u:=2;
drawdot origin withcolor red
    withpen pencircle scaled 2;
path p;
p:= fullsquare xyscaled (20u,15u);
draw p rotated 15u;
```

- ★ ; musi zakończyć polecenia
compulsory ; ends the statement
- ★ Typ zmiennej trzeba zadeklarować (chyba, że to *numeric*)
You have to type your variables (you may not do it for *numeric*)
- ★ *path* to ścieżka zamknięta lub otwarta
path may be opened or closed
- ★ Polecenia są wykonane w kolei zgłoszenia
Instructions are executed from left to right
- ★ Przydatna praktyka to deklarować jednostkę, której wartości można ewentualnie zmienić
A usual practice is to declare a unit that you may change later
- ★ := dla deklarowania zmiennych
:= for assignments
- ★ % przed komentarzem (tekstem, który nie zostanie kompilowany)
% before comments (text, that won't be compiled)

Indeksowanie zmiennych Variable Indexation

- ★ To pożyteczny sposób nazywania zmiennych
A convenient way to name your variables
- ★ Można to wykorzystać w pętlach
You may use it in loops
- ★ Składnia:
Syntax:

```
path ch[];  
pair ch[] [];
```

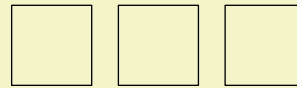
```
% możnaby również pisać ch[1]  
% you may also write ch[1]  
ch1:= fullsquare scaled 40;  
% możnaby również pisać ch[1][1] or ch1[1]  
% you may also write ch[1][1] or ch1[1]  
ch[1]1= (40,0);
```

Pętle
Loops

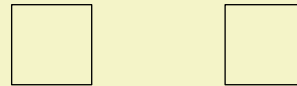
```
if... else... fi  
numeric i; i=30;  
if odd i:  
    draw fullsquare scaled i;  
else:  
    draw fullcircle scaled i;  
fi;
```



```
for... upto... endfor  
for i=0 upto 2:  
    draw fullsquare scaled 30  
    xshifted 40i ;  
endfor;
```

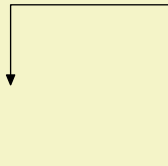
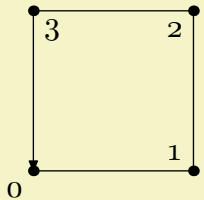


```
for... upto... endfor  
for i=0 step 2 until 2:  
    draw fullsquare scaled 30  
    xshifted 40i ;  
endfor;
```

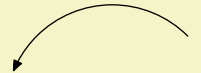
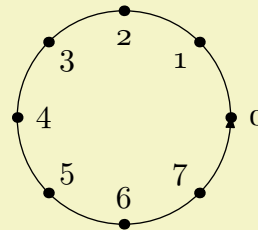


Podścieżka Subpath

```
subpath
  path p[];
  p0:= fullsquare scaled 60;
  drawarrow p0;
  drawpoints p0;
  drawpointlabels p0;
  p1:= subpath (1,3.5) of p0 xshifted
  150;
  drawarrow p1;
```



```
subpath
  path p[];
  p0:= fullcircle scaled 80;
  drawarrow p0;
  drawpoints p0;
  drawpointlabels p0;
  p1:= subpath (1,3.5) of p0
  xshifted 150;
  drawarrow p1;
```



II) Do dzie(a)ła!
Let's g(r)o(w)!

Deklaracja Declaration

ConT_EXt

```
\starttext  
  \startMPcode  
  \stopMPcode  
\stoptext
```

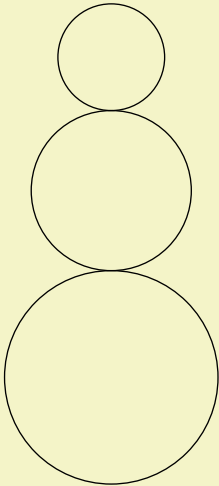
MetaFun

```
\startMPpage  
\stopMPpage
```

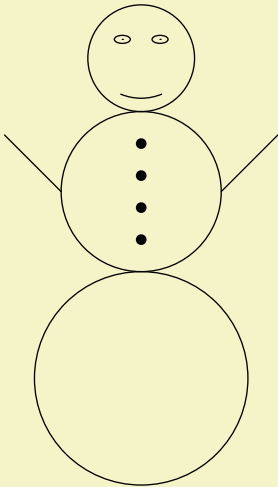
MetaPost

```
beginfig (1);  
endfig;
```

- 1) Poziom I: yeti
Level I: the yeti

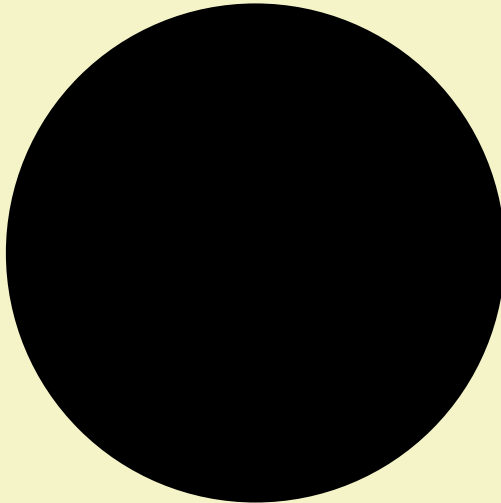


```
path bn[];  
pair bn[][];  
bn1:= fullcircle scaled 80;  
bn2:= bn1 scaled .75 yshifted 70 ;  
bn3:= bn1 scaled .5 yshifted 120 ;  
for i=1 upto 3:  
    draw bn[i];  
endfor;
```

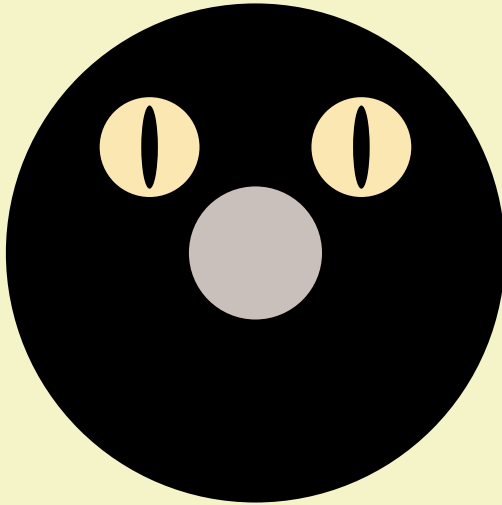


```
for i=1 upto 4:
  bn2[i]:= point i/5 of (point 2 of bn2 -- point 6 of
bn2);
  fill fullcircle scaled 4 shifted bn2[i];
endfor;
bn3[1]:= 1/2[center bn3,point 3 of bn3];
bn3[2]:= bn3[1] reflectedabout (bn2[1],bn2[2]);
bn30:= fullcircle xyscaled (6,3);
bn10:= (origin -- 30*dir 135) shifted point 4 of bn2;
bn11:= bn10 reflectedabout (bn2[1],bn2[2]);
for i=1 upto 2:
  draw bn3[i] ;
  draw bn30 shifted bn3[i] ;
  draw bn[9+i];
endfor;
bn4:= subpath (5.5,6.5) of bn3 yshifted 5;
draw bn4;
```

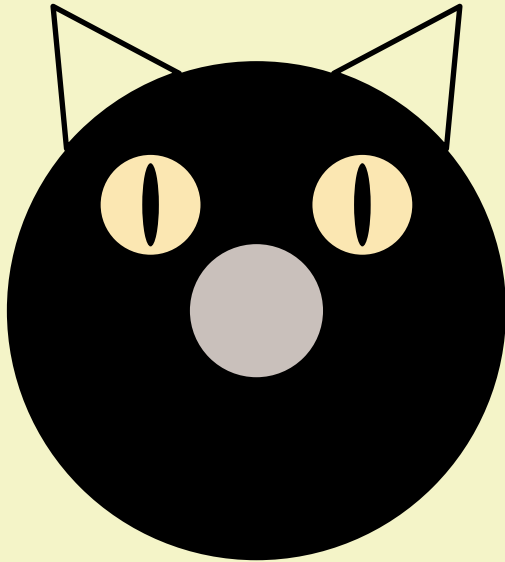

2) Poziom II: głowa kota
Level II: a cat's head



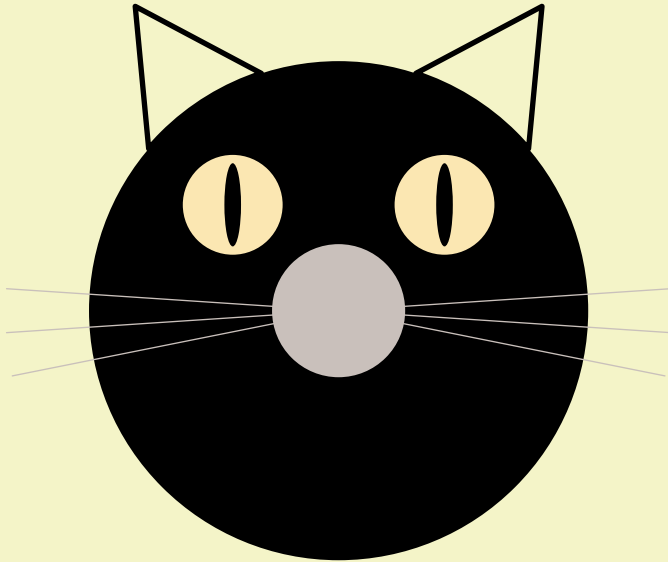
```
% put \usecolors [crayola] in your preamble
path ch[];
pair ch[] [];
u:=2.2mm;
% incontestablement inspiré par Gelluck
% visage
ch1:= fullcircle scaled 30u;
% museau
ch2:= fullcircle scaled 8u;
fill ch1;
```



```
% yeux
ch3:= fullcircle scaled 6u
      shifted 3/5 [origin,point 1 of ch1];
% prunelles
ch5:= fullcircle xyscaled (u,5u)
      shifted 3/5 [origin,point 1 of ch1];
% symetrie
for i=3 step 2 until 5:
    ch[i+1]:= ch[i] reflectedabout (origin,(0,10)) ;
endfor;
for i=3 upto 6:
    fill ch[i]
        if i<5 : withcolor "BananaMania" fi;
endfor;
fill ch2 withcolor "Silver";
```



```
% pour les oreilles, je tente un contour  
% de forte épaisseur, cela devrait m'épargner  
% des subpath  
ch7:= subpath (.9,1.6) of ch1;  
ch7:= ch7 -- 22u*dir 56.25 -- cycle;  
ch8:= ch7 reflectedabout (origin,(0,10));  
for i=7 upto 8:  
    draw ch[i] withpen pencircle scaled 2;  
endfor;
```



```
% moustaches
for i= 9 step 2 until 13:
    ch[i]:= center ch2 --
        point ((i-9)/3) of
            subpath (7.75,8.25) of ch2;
    ch[i]:= ch[i] stretched 5;
    ch[i+1]:= ch[i]
        reflectedabout (origin,(0,10)) ;
endfor;

for i=9 upto 14:
    draw ch[i] withcolor "Silver";
endfor;
```