Drawing

1 Fonts

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2 Drawing a Die

Suppose we want to draw a die

To do that, let us first define a macro which will draw a single face of the die: a square with number `s` on it.

```
def face (expr s) = image (begingroup
  pickup pencircle scaled 1pt;
  draw (0.5, 0.5) -- (0.5, 9.5) -- (9.5, 9.5) -- (9.5, 0.5) -- cycle;
  label (s, (5.75, 5.75)) scaled 0.85;
endgroup) scaled 10 enddef;
```

Now we can draw it using

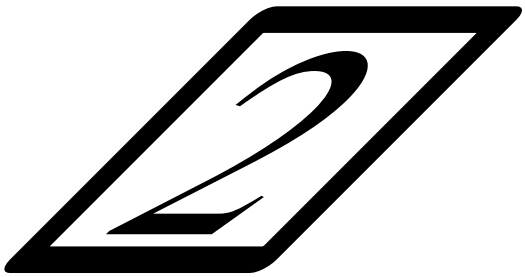
```
draw face ("1");
```

and get the picture:

Next, we need an upper face and a right face. To draw them, we will have to compose an affine transformation to skew them. This can be tricky since the only readily available primitive transformation for skewing is slanted a which transforms a point `(x, y)` into `(x + ay, y)`.

```
draw face ("1");
```

Here is our picture slanted 2:



To make it look realistic for the eye leve we will scale it along the y-axis

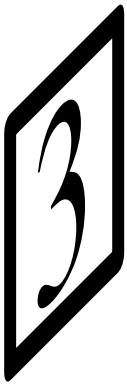
```
draw face ("2") yscaled 0.45 slanted 1;
```

This shoule yield us following picture

Now let's do the right side projection. We will x-scale it by the same factor, turn it -90 degrees slant it -1 and then turn it back up

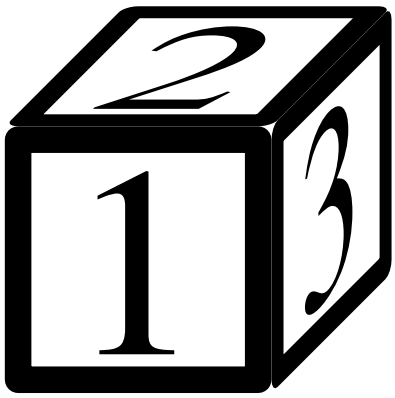
```
draw face ("3") xscaled 0.45 rotated -90 slanted -1 rotated 90;
```

This should yield us following picture



Now let's put it together by shifting top face by 100 on `y` and shifting right face by 100 on `x`

```
draw face ("1");
draw face ("2") yscaled 0.45 slanted 1 shifted (0,100);
draw face ("3") xscaled 0.45 rotated -90 slanted -1 rotated 90 shifted (100,0);
```



Now we can turn the die into a `picture`

Drawing it as image with transformation

```
picture die;
die := image(
begingroup
draw face ("1");
draw face ("2") yscaled 0.45 slanted 1 shifted (0,100);
draw face ("3") xscaled 0.45 rotated -90 slanted -1 rotated 90 shifted (100,0);
endgroup
);
draw die rotated 45;
```