

# py5 cheatsheet

Complete reference at  
<https://py5.ixora.io/reference>

## Program Structure

Structuring a static sketch:

```
size(400, 200)
run this code once
```

Structuring an animated sketch:

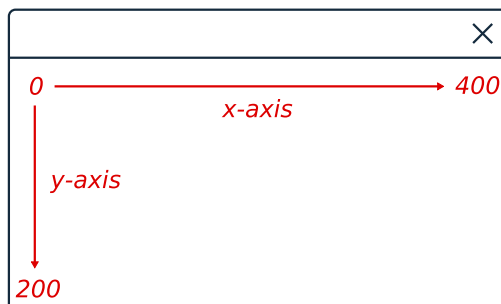
```
def setup():
    size(400, 200)
    run this code once at start
def draw():
    run this code every frame
```

Function anatomy:

**size(400, 200)**

function name | width | height  
 arguments

The default coordinate space:



## Comments

```
# this is a single line comment
'''
this is a
multiline comment
'''
```

## Fills & Strokes

```
background(color) # set bg color
fill(color) # set fill color
no_fill() # disable the fill
stroke(color) # set stroke color
stroke_weight() # stroke width in px
no_stroke() # disable the stroke
```

A red fill using three different color values:

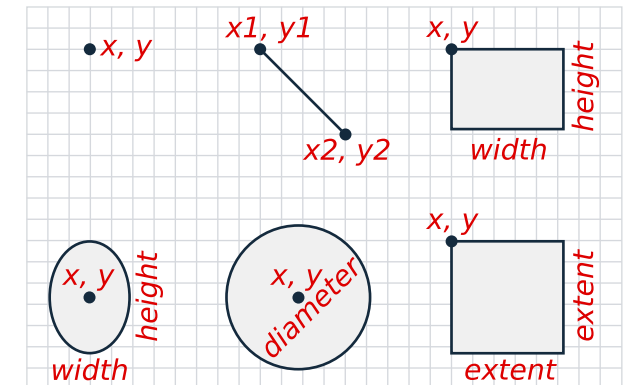
```
fill('#FF0000') # hexadecimal
fill(255, 0, 0) # red, green, blue
# HSB (Hue Saturation brightness)
color_mode(HSB, 360, 100, 100)
fill(0, 100, 100)
```

## Print

```
print(value) # prints to console
```

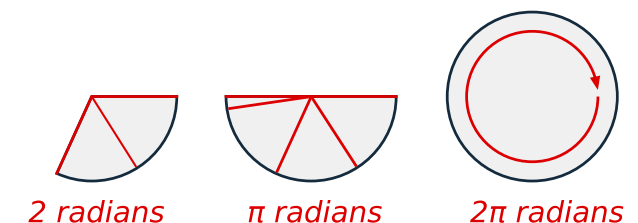
## 2D Primitives

```
point(x, y)
line(x1, y1, x2, y2)
rect(x, y, width, height)
ellipse(x, y, width, height)
circle(x, y, diameter)
square(x, y, extent)
```



```
arc(x, y, width, height, start, end)
```

For measuring arc angles, use radians:



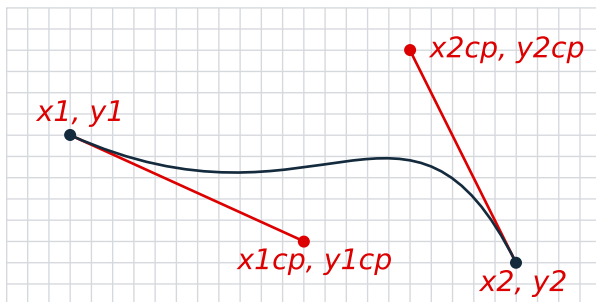
## Shapes

Draw complex shapes using vertices nested within `beginShape()` and `endShape()` functions:

```
begin_shape()
vertex(x1, y1)
vertex(x2, y2)
# add more vertices here
end_shape(CLOSE)
```

For curved shapes, use a Bézier-vertex function:

```
begin_shape()
vertex(x1, y1) # vertex 1
bezier_vertex(
  x1cp, y1cp, # control point 1
  x2cp, y2cp, # control point 2
  x2, y2)     # vertex 2
# add more vertices or beziers here
end_shape()
```



## Typography

```
textFont(createFont(font, size))
textSize(rendered_size)
text('text', x, y)
```

## Math

Use arithmetic operators to add, subtract, etc:

+ - \* / %

Use brackets to override operator precedence:

```
(1 + 2) * 3 # equals 9, not 7
```

## Random

For unexpected values, use the random function:

```
random(10) # 0.0 up to not inc. 10
random(5, 10) # 5.0 to not inc. 10
int(random(5, 10)) # integer value
```

To set the seed value for the pseudo-random generator, use:

```
randomSeed(integer)
```

## Constants & System Variables

For different values of pi, use these constants:

PI HALF\_PI QUARTER\_PI TAU

Some useful Processing system variables:

```
width, height # sketch width, height
mouse_x, mouse_y # mouse x, y coords
frame_count # current frame number
get_frame_rate() # sketch frameRate
```

## Control Flow

Python if-then logic:

```
if condition_a:
    if condition_a is true, do this
elif condition_b:
    if condition_b is true, do this
else:
    if condition_a/b false, do this
```

Relational operators:

== != > < >= <=

Logical operators:

and or not

Iteration using a for-loop:

```
# displays 0, 1, 2 in console
for i in range(3):
    print(i)
```

Looping through a list:

```
list = [3, 4, 5]

# displays 3, 4, 5 in console
for i in list:
    print(i)
```