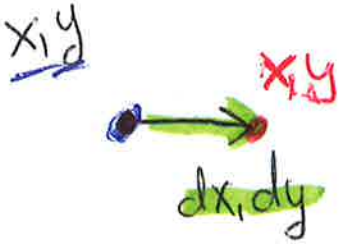
Linear motion, frame based

①

move()

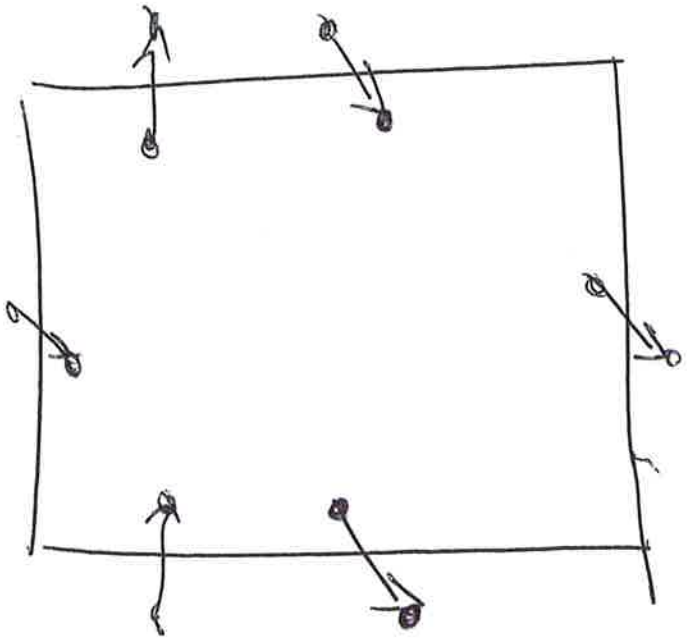
$x = x + dx$

$y = y + dy$



wrapping

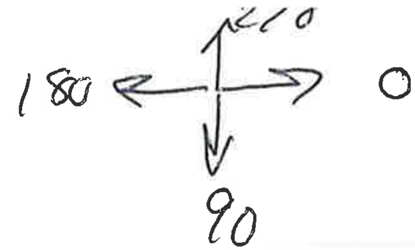
(2)



```
x = x + dx
y = y + dy

if y > height:
    y = y - height

if x > width:
    x = x - width

if y < 0:
    y += height

if x < 0:
    x += width
```

rotation | direction

(3)



dldir

spin()

```
dir = dir + dldir

if dir >= 360:
    dir -= 360

if dir < 0:
    dir += 360
```

Acceleration (9)

$$dx = dx + a\cos(dir)$$
$$dy = dy + a\sin(dir)$$

radian

~~change in~~

rotational acceleration

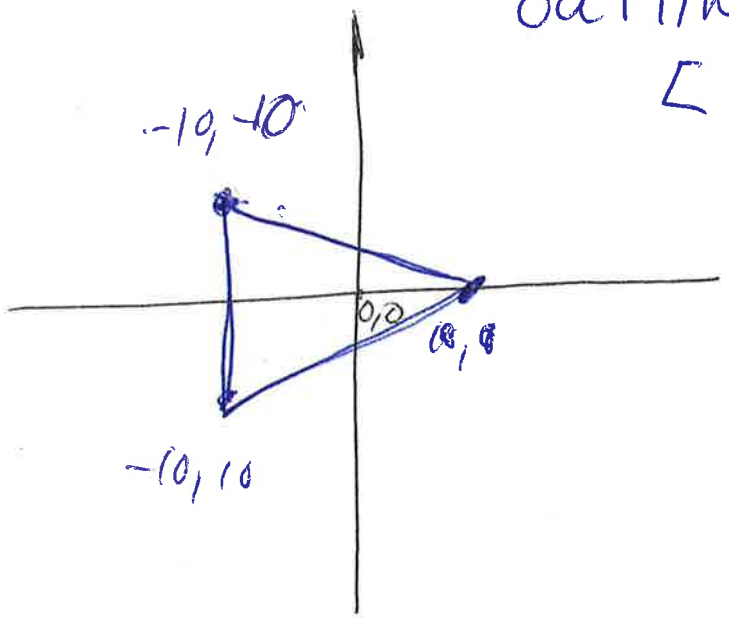
(5)

$d\alpha$

$d\vec{\omega}$

$d\vec{\omega} = d\vec{\omega} + d\vec{\alpha}$

10



outline =

[(0,0), (-10, -10), (-10, 10)]

10

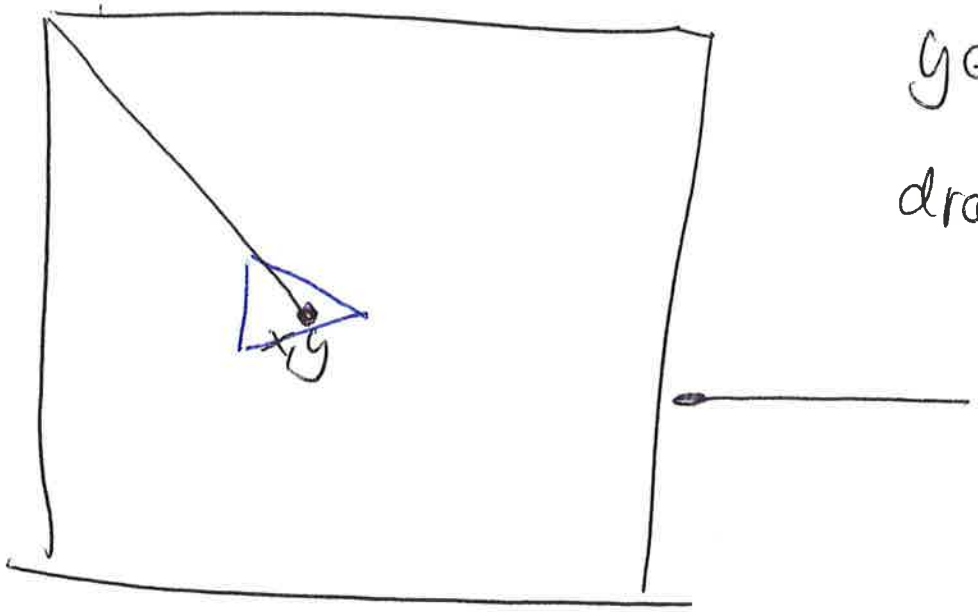
~~# translate~~

for point in outline:

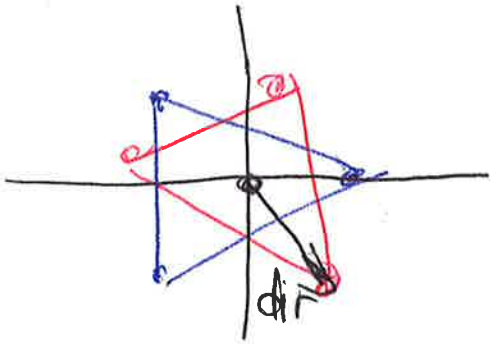
x ~~draw~~ = x + point[0]

y ~~draw~~ = y + point[1]

draw-outline.append((x, y))



(12) Rotate point about center



xo = point[0]

yo = point[1]

$r = \sqrt{xo^2 + yo^2}$

thetaO = math.atan2(yo, xo)

theta1 = thetaO + dir (dir: radian)

xr = r * cos(theta1)

yr = r * sin(theta1)