Calculus in Real Life 1.0

Game Object
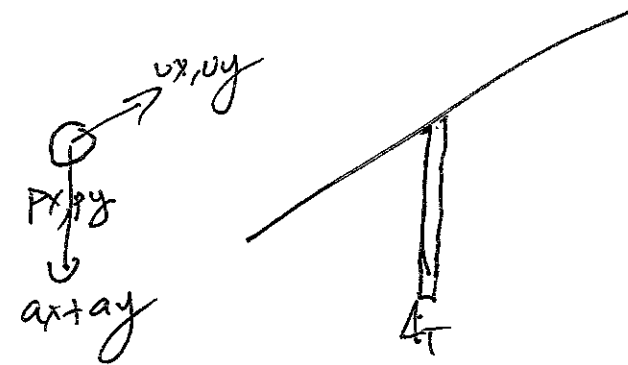- → Transform
  - └ Position
- → Rigid Body
  - └ velocity
  - └ acceleration

$$V_T = V_{T-1} + \boxed{a_{T-1}} \cdot \Delta_T \quad \Rightarrow \text{Update}$$
$$\Rightarrow \text{Fixed Update}$$

$$P_T = P_{T-1} + \boxed{V_{T-1}} \cdot \Delta_T$$

a_T

V_T

$V_x \mathrel{+}= a_x \cdot deltaTime$

$V_y \mathrel{+}= a_y \cdot deltaTime$

$Px \mathrel{+}= V_x \cdot deltaTime$

$P_y \mathrel{+}= v_y \cdot deltaTime$

Calculus

derivative $f'()$ $\dfrac{dx}{dt}$

Distance | ax
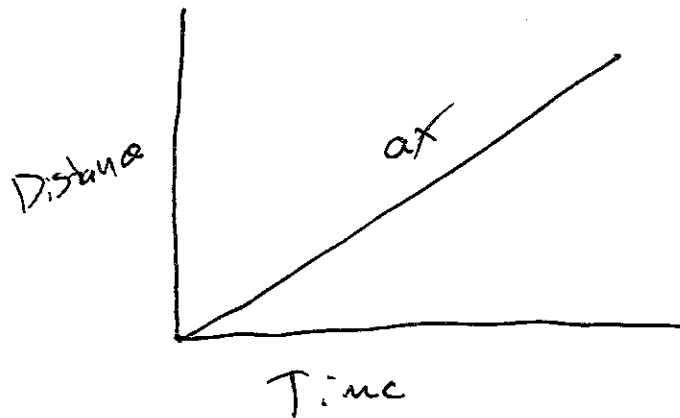
Time

$\Rightarrow$ Velocity
derivative
of position

$\Rightarrow$ a
speed

Time = a

Time

$\leftarrow$ Position
integral
of Velocity
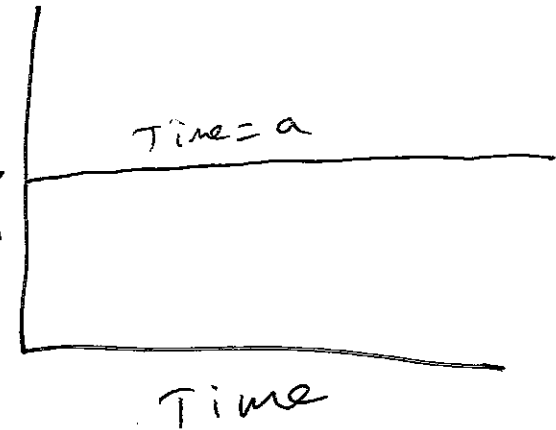
acceleration   Velocity
derivative   integral
of velocity   of acceleration
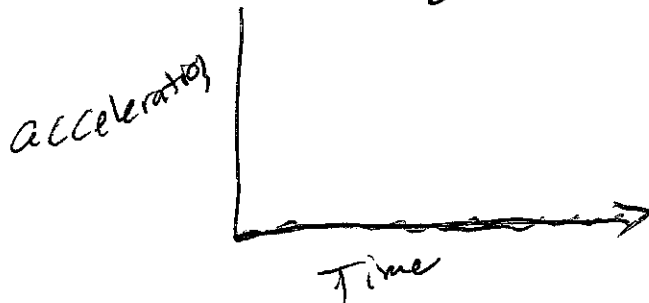
acceleration

Time

Physics in Real Life

$$Vy += 9.81 | 32 \cdot deltaTime$$

$$Px += $$

$$Py += $$

Only Gravity

Jump + Gravity

2.1 Instantaneous force
(acceleration)

2.2 Instantaneous Velocity