No.

6/1 0:00

$$\begin{cases} f_{k+1} = f_k + h(-f_k + \cos(kh)) \\ h = 0.01 \\ f_0 = 2 \end{cases}$$

[差分法, 由来 $\begin{cases} f' = -f + \cos(t) \\ f(0) = 2 \quad f' = \dfrac{df}{dt} \end{cases}$]

テキストP31

$a > 0$ → A

$$\begin{cases} x_{n+1} = \dfrac{x_n + \dfrac{a}{x_n}}{2} \\ x_0 = a \end{cases}$$

X, Y, $n \leftrightarrow I$

(実は x_n は $\sqrt{a}$ に近づくことが知られている)

```
A=2.0;
X=A;
for(I=0; I<5; I++){
    Y=(X+A/X)/2;
    print(Y);
    X=Y;
}
```

= ~~等しい~~

右辺を計算してから、左辺の変数に代入

▨ = ◍

変数名のみ　式

変数：数などを格納しておく箱のようなもの

X

~~2.0~~ 1.4	~~0~~
~~1.5~~	1

I

Y

~~1.5~~
1.4

$\left(2.0 + \dfrac{2.0}{2.0}\right)/2 = 1.5$

$\left(1.5 + \dfrac{2.0}{1.5}\right)/2 \fallingdotseq 1.4 \cdots$

24:40

No.

24:40

$$f_{k+1} = f_k + h(-f_k + \cos(kh))$$

F　　H

```
H=0.01;
F=2;
for (I=1;I<=100;I++){
  F=F+H*(-F+cos(I*H))
  print(F);
}
```

deval(cos(I*H))

```
A=10;  B=5;
print(A);   10 次の行へ
print(B);   5
```

```
A=10;  B=5;
print(A,0);   10 5
print(B);
print("  ",0);
```

出力のあと
次の行へいかない

10 5

文字列

```
print("hello");
```

hello

```
print("hello"+"world")
```

hello world

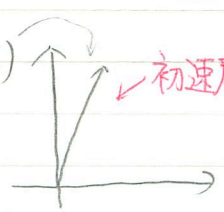
35:29

2:05

$$\begin{cases} x(x)' = P(t) \\ P'(t) = 0 \\ y'(t) = z(t) \\ z'(t) = -9.8 \end{cases}$$

$x(0)=0,\ y(0)=0$ ← 時刻0での球の位置

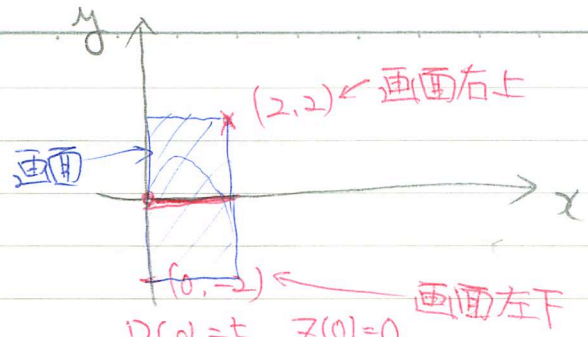
$P(0)=1,\ z(0)=5$ ← (1,5)



← 初速度

5:15

5:15



glib_line (0,0, 2,0 | color=0xff0000);

(0,0) より (2,0) へ赤で線を引く

glib_window (0,-2, [2,2])

P26

P(0)=5, Z(0)=0

P(0)=0, Z(0)=5

$$\begin{cases} x_{k+1} = x_k + hP_k \\ P_{k+1} = P_k \\ y_{k+1} = y_k + hZ_k \\ Z_{k+1} = Z_k - 9.8h \end{cases}$$

Xnew, Pnew, Ynew, Znew

X, P, Y, Z

$x_0 = 0,\ y_0 = 0$

$P_0 = 1,\ Z_0 = 5$

```
X=0;
Y=0;
P=1;
Z=5;
H=0.1;
```

```
print([X,P,Y,Z]);
```

[0, 1, 0, 5]

```
Xnew = X+H*P;
Pnew = P;
Ynew = Y+H*Z;
Znew = Z-9.8*H
```

X: ~~0~~ 0.1

Xnew: 0.1 — 0+0.1×1, 0.1+0.1×1 = 0.2

P: ~~1~~ 1

Pnew: 1

Y: ~~0~~ 0.5

Ynew: 0.5 — 0+0.1×5

Z: ~~5~~ 4.02

Znew: 4.02 — 5−9.8×0.1

31:25