Fórmulas:

Vertical

$$z(t) = h + Voz + \frac{at^2}{2} \qquad (1)$$

Horizontal

$$x(t) = Vox * t \qquad (2)$$

Despejamos t de (2)

$$t = \frac{x(t)}{Vox} \qquad (3)$$

Sustituimos (3) en (1)

$$z(t) = h + Voz + \frac{a * \left(\frac{x(t)}{Vox}\right)^2}{2}$$

En Matlab

```
h= 50;
Voz= 20;
a= 9.81;
t= 0:1:20;
xt= 20*cos(0).*t;
zt= h +Voz+ (a*(x./Voz).^2)/2

figure(1),plot(t,zt,'*'), title ('Grv°fica Vz(t)'),xlabel('t=sec'),
ylabel('Y= m')
figure(2),plot(t,xt,'*'), title ('Grv°fica Vx(t)'),xlabel('t=sec'),
ylabel('X= m')
figure(3),plot(xt,zt,'*'), title ('Grv°fica Vx(t)'),xlabel('X=m'),
ylabel('Y= m')
```

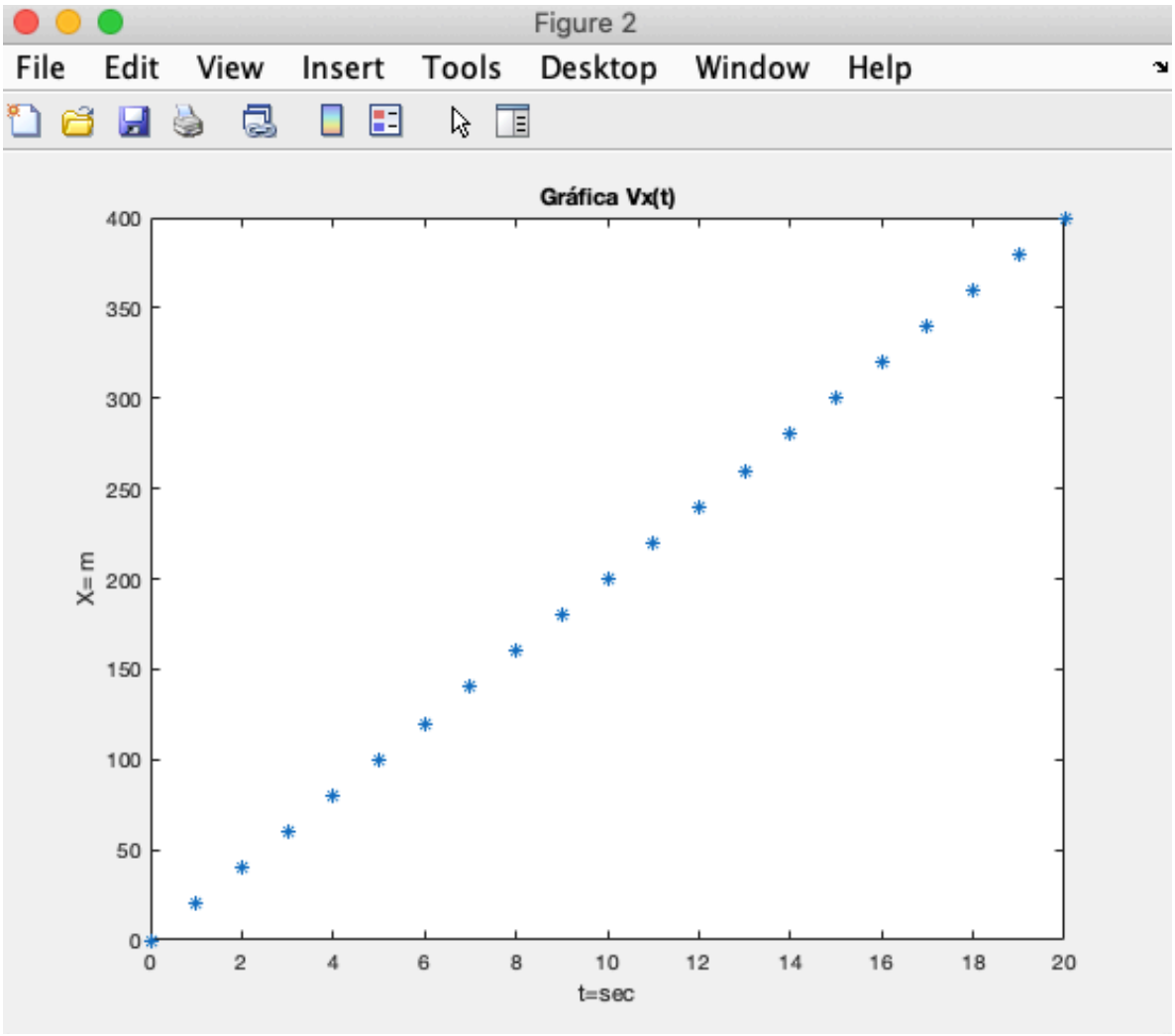
Figure 2
File Edit View Insert Tools Desktop Window Help
Gráfica Vx(t)
X= m
t=sec
0
50
100
150
200
250
300
350
400
0 2 4 6 8 10 12 14 16 18 20

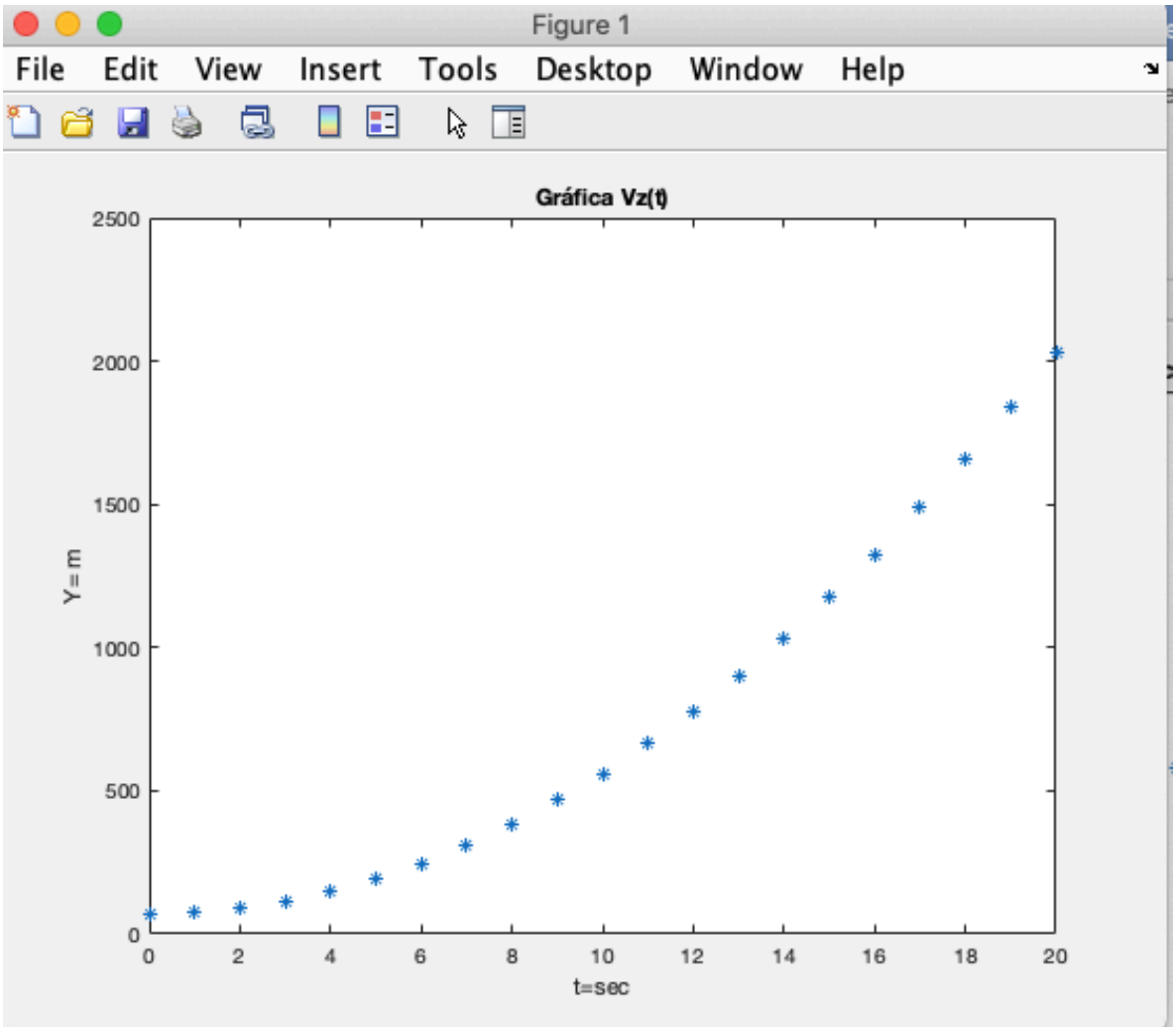
Figure 1
File Edit View Insert Tools Desktop Window Help
Gráfica Vz(t)
Y= m
t=sec
0
500
1000
1500
2000
2500
0 2 4 6 8 10 12 14 16 18 20

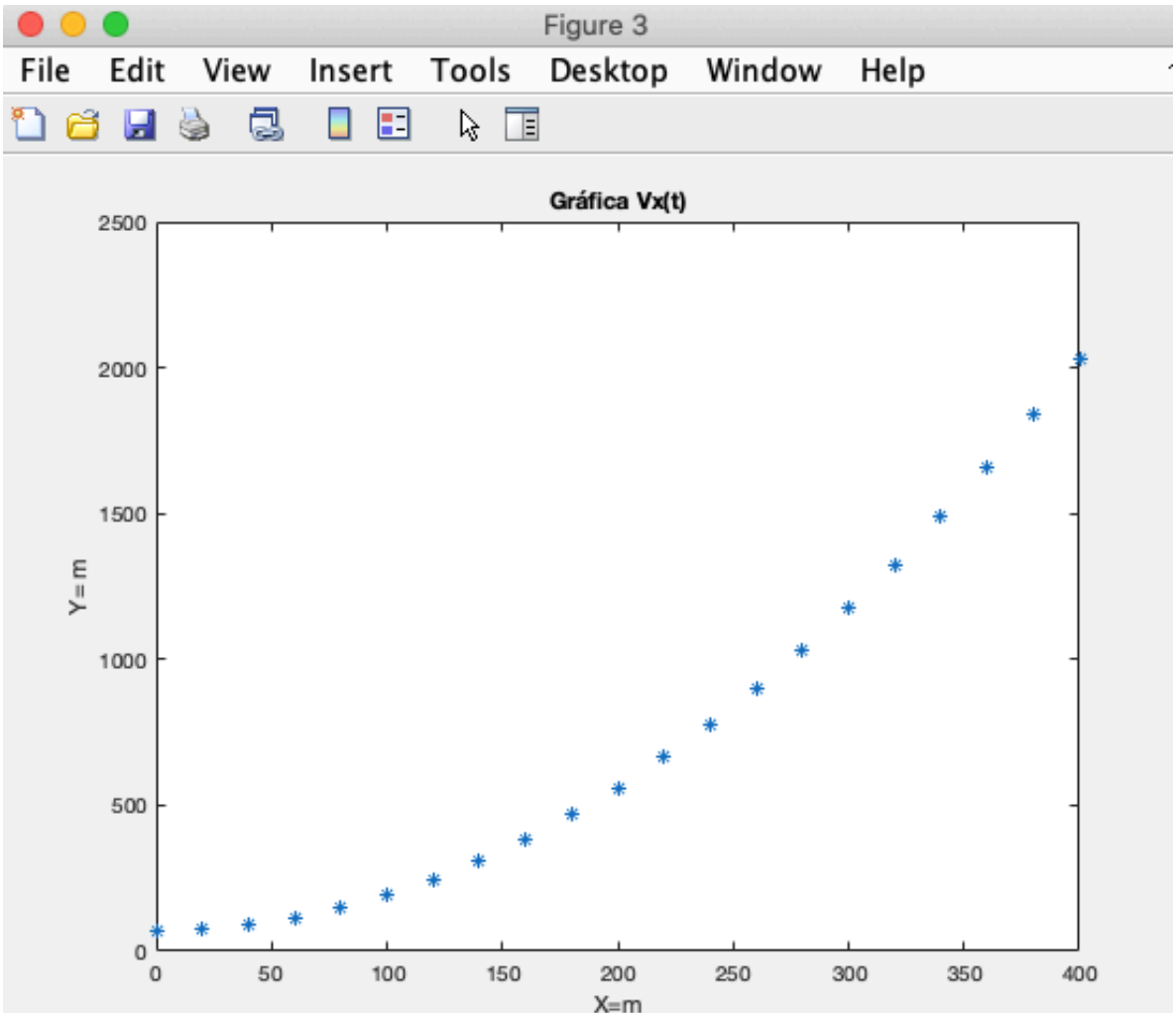
Figure 3
File Edit View Insert Tools Desktop Window Help
Gráfica Vx(t)
Y= m
X=m
0
500
1000
1500
2000
2500
0 50 100 150 200 250 300 350 400