Example 1.1. A pig weighing 200 pounds gains 5 pounds per day and costs 45 cents a day to keep. The market price for pigs is 65 cents per pound, but is falling 1 cent per day. When should the pig be sold?

Start at $t=0$

measure t in days

Weight of pig $= w(t) = 200 + 5t$

cost to keep pig $= c(t) = (0.45)t$

price/lb to sell pig $= p(t) = 0.65 - 0.01t$

Revenue from selling $= R(t) = w(t)p(t)$

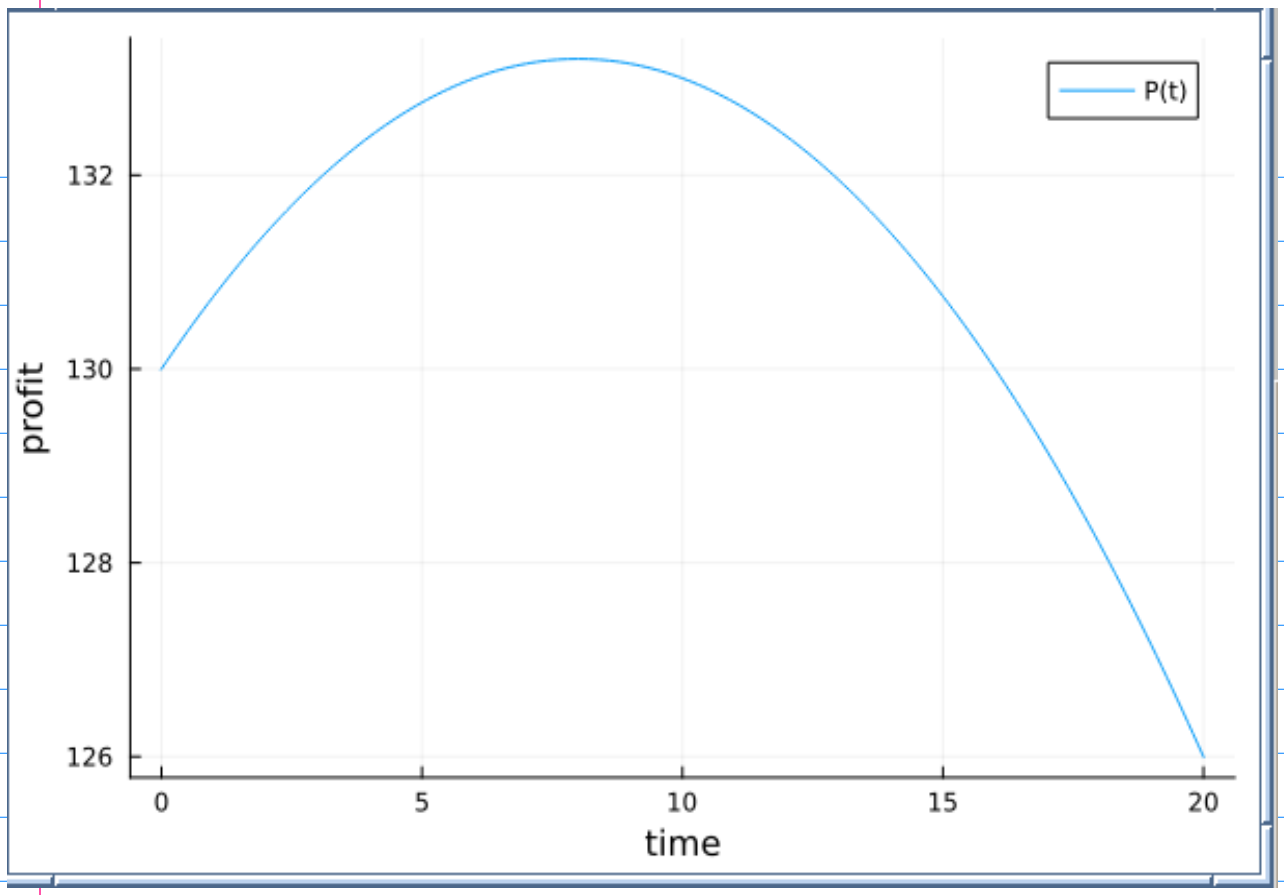
Profit selling at time $t = P(t) = R(t) - C(t)$.

1. Ask the question.
2. Select the modeling approach.
3. Formulate the model.
4. Solve the model.
5. Answer the question.

```
julia> w(t)=200+5*t
w (generic function with 1 method)

julia> c(t)=0.45*t
c (generic function with 1 method)

julia> p(t)=0.65-0.01*t
p (generic function with 1 method)

julia> R(t)=w(t)*p(t)
R (generic function with 1 method)

julia> P(t)=R(t)-c(t)
P (generic function with 1 method)
```

```
julia> using Plots
```

```
julia> plot(P,0:0.1:20,xlabel="time",
            ylabel="profit",label="P(t)")
```


P(t)
132
130
128
126
profit
0
5
10
15
20
time