

Office hours for Wed. Jan 28 cancelled. Please send a message on webcampus if you want to talk on zoom later today or tomorrow. Regular office hours resume on Friday.

```
julia> p1(x1,x2)=339-1//100*x1-3//1000*x2
p1 (generic function with 1 method)
```

```
julia> p2(x1,x2)=399-4//1000*x1-1//100*x2
p2 (generic function with 1 method)
```

```
julia> C(x1,x2)=400_000+195*x1+225*x2
C (generic function with 1 method)
```

```
julia> R(x1,x2)=x1*p1(x1,x2)+x2*p2(x1,x2)
R (generic function with 1 method)
```

```
julia> P(x1,x2)=R(x1,x2)-C(x1,x2)
P (generic function with 1 method)
```

```
julia> using Symbolics
```

```
julia> @variables x1,x2
2-element Vector{Num}:
 x1
 x2
```

```
julia> P(x1,x2)
-400000 - 195x1 - 225x2 + x1*(339 - (1//100)*x1 - (3//1000)*x2) + (399 - (1//250)
)*x1 - (1//100)*x2)*x2
```

```
julia> D(f,x)=expand_derivatives(Differential(x)(f))
D (generic function with 1 method)
```

```
julia> dpdx1=D(P(x1,x2),x1)
144 - (1//50)*x1 - (7//1000)*x2
```

```
julia> dpdx2=D(P(x1,x2),x2)
174 - (7//1000)*x1 - (1//50)*x2
```

```
julia> A=[1//50 7//1000; 7//1000 1//50]
2×2 Matrix{Rational{Int64}}:
 1//50    7//1000
 7//1000  1//50
```

```
julia> b=[144,174]
2-element Vector{Int64}:
 144
 174
```

Need to

$$\text{Solve } A \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = b$$

left matrix division

$$X = A \setminus b$$

```
julia> X=A\b
2-element Vector{Rational{Int64}}:
 554000//117
 824000//117
```

```
julia> Float64.(X)
2-element Vector{Float64}:
 4735.042735042735
 7042.735042735043
```

← optional use except
not integers..