```
Activating project at `~/.julia/environments/v1.8`
```

Метод пристрелки

$$y'(x) - \frac{2}{x}y'(x) - \frac{4}{x^2+2}y(x) = 8$$

$$0.5 \leq x \leq 1$$

$$y'(0.5) = 0.5, y(1) + y'(1) = 1$$

```
(0, 1)
```

```
α₀, α₁ = 0, 1
```

```
(1, 1)
```

```
β₀, β₁ = 1, 1
```

```
(0.5, 1)
```

```
γ₀, γ₁ = 0.5, 1
```

```
z (generic function with 1 method)
```

```
z(x, y) = [
    y[2],
    -2/x*y[2] + 4/(x^2+2)*y[1] - 8
]
```

```
h = 0.01
```

```
h = .01
```

```
[[0.5, -1.0]]
```

```
begin
    x₁ = [0.5]
    z₁ = [[γ₀, -1]]
end
```

```
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```

```
for i in 1:round(Int, (1-.5)/h)
    k₁ = h * z(x₁[end], z₁[end])
    k₂ = h * z(h/2 + x₁[end], k₁/2 + z₁[end])
    k₃ = h * z(h/2 + x₁[end], k₂/2 + z₁[end])
    k₄ = h * z(h/2 + x₁[end], k₃/2 + z₁[end])

    push!(x₁, x₁[end]+h)
    push!(z₁, z₁[end]+(k₁ + 2k₂ + 2k₃ + k₄)/6)
end
```

```
[0.5, 0.489871, 0.479432, 0.468686, 0.457634, 0.446277, 0.434618, 0.422656, 0.410392, 0.39
```

```
first.(z₁)
```

```
[[0.5, 1.0]]
```

```
begin
    x₂ = [.5]
    z₂ = [[y₀, 1]]
end
```

```
for i in 1:round(Int, (1-.5)/h)
    k₁ = h * z(x₂[end], z₂[end])
    k₂ = h * z(h/2 + x₂[end], k₁/2 + z₂[end])
    k₃ = h * z(h/2 + x₂[end], k₂/2 + z₂[end])
    k₄ = h * z(h/2 + x₂[end], k₃/2 + z₂[end])

    push!(x₂, x₂[end]+h)
    push!(z₂, z₂[end]+(k₁ + 2k₂ + 2k₃ + k₄)/6)
end
```

```
[0.5, 0.509544, 0.518019, 0.525475, 0.531956, 0.537503, 0.542155, 0.545947, 0.548911, 0.55
```

```
first.(z₂)
```

```
[0.5, 0.51, 0.52, 0.53, 0.54, 0.55, 0.56, 0.57, 0.58, 0.59, 0.6, 0.61, 0.62, 0.63, 0.64, 0.
```

```
x₂
```

```
t₂ = 0.432066903710261
```

```
t₂ = 1 - (first(z₂[end]) * 2)/(first(z₂[end]) - first(z₁[end]))
```

```
[[0.5, 0.432067]]
```

```
begin
    x₃ = [.5]
    z₃ = [[y₀, t₂]]
end
```

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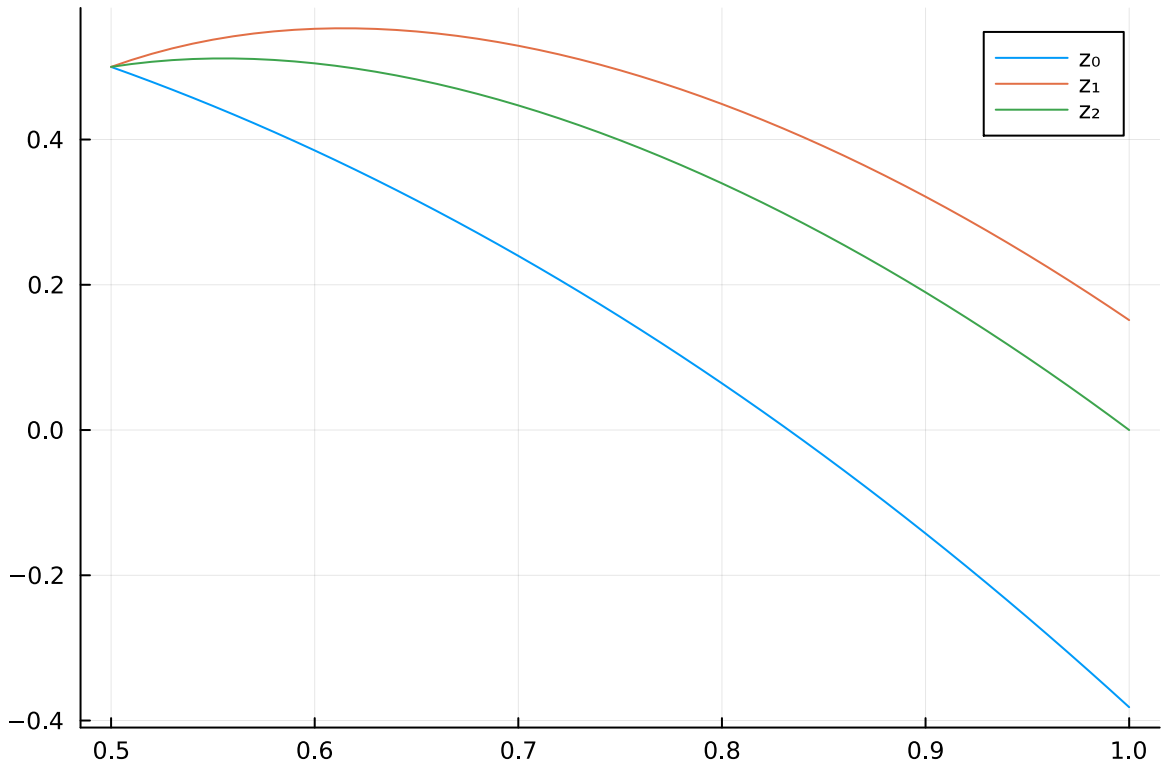
```
for i in 1:round(Int, (1-.5)/h)
    k₁ = h * z(x₃[end], z₃[end])
    k₂ = h * z(h/2 + x₃[end], k₁/2 + z₃[end])
    k₃ = h * z(h/2 + x₃[end], k₂/2 + z₃[end])
    k₄ = h * z(h/2 + x₃[end], k₃/2 + z₃[end])

    push!(x₃, x₃[end]+h)
    push!(z₃, z₃[end]+(k₁ + 2k₂ + 2k₃ + k₄)/6)
end
```

```
[0.5, 0.504908, 0.446963, 0.339674, 0.189631, -4.47559e-16]
```

```
first.(z₃)[1:10:end]
```



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	x	z_1	z_2	z_3
1	0.5	0.5	0.5	0.5
2	0.6	0.384963	0.552476	0.504908
3	0.7	0.2398	0.529121	0.446963
4	0.8	0.0642982	0.448884	0.339674
5	0.9	-0.142438	0.321325	0.189631
6	1.0	-0.381633	0.151349	-4.47559e-16

```
DataFrame(
    x=x₁[1:10:end],
    z₁=first.(z₁)[1:10:end],
    z₂=first.(z₂)[1:10:end],
    z₃=first.(z₃)[1:10:end]
)
```

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