

Optimization

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Wrapping up the Golden-Section Search Method



Golden-Section Search Method Pseudocode

```
define/declare phi  
declare tol, x1, x2, d, xopt  
declare/define error
```



```
d = (phi - 1) (xu - x1)  
x1 = x1 + d;  
x2 = xu - d;
```

```
while error > tol  
    if f(x1) < f(x2)  
        x1 = x2;  
        x2 = x1;  
        d = (phi - 1) (xu - x1);  
        x1 = x1 + d;  
        xopt = x1;  
    else  
        xu = x1;  
        x1 = x2;  
        d = (phi - 1) (xu - x1);  
        x2 = xu - d;  
        xopt = x2;  
error = (2 - phi) * abs((xu - x1) / xopt);
```



Let's code it!

We are going to write this function and apply it to

$$f(x) = \frac{x^2}{10} - 2\sin(x)$$



With an initial $x_l = 0$, $x_u = 4$. Remembering our plot:

