

Solving Optimization Problems: Guess & Refine

Start with a point (guess)

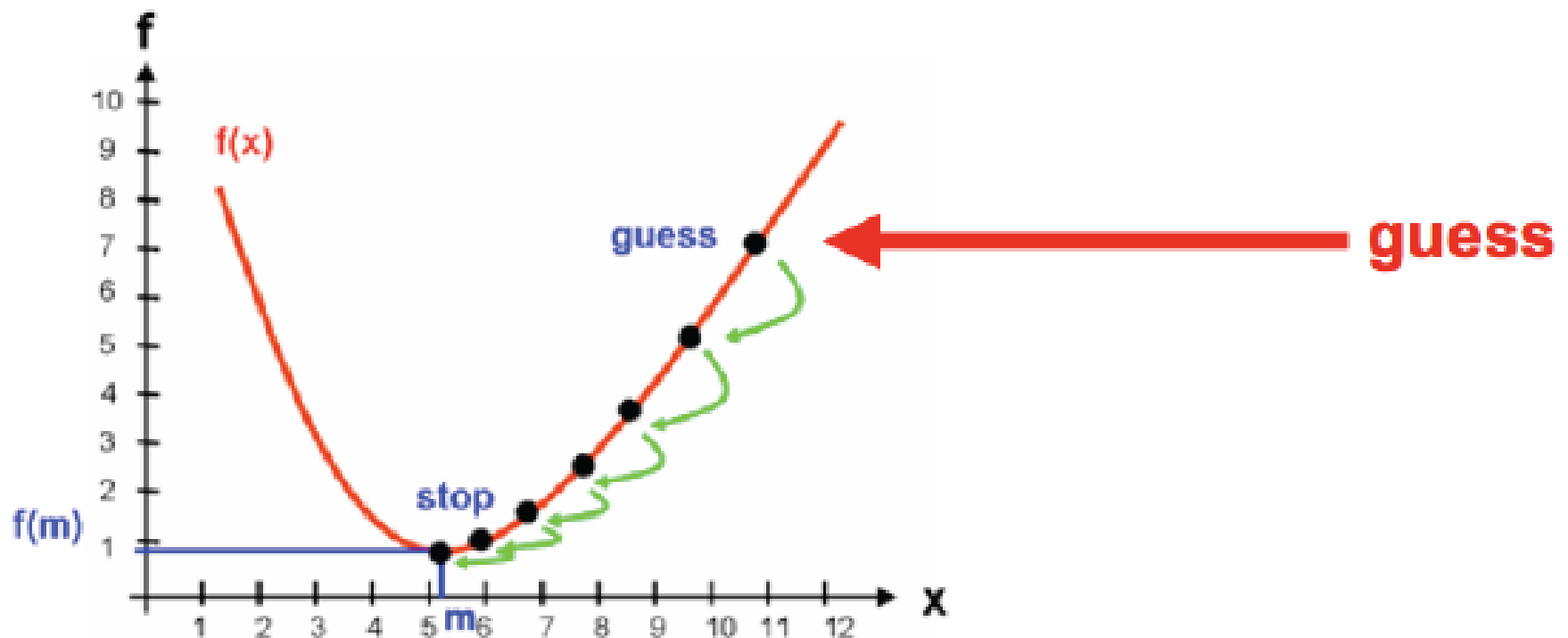
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



Start with a point (guess)

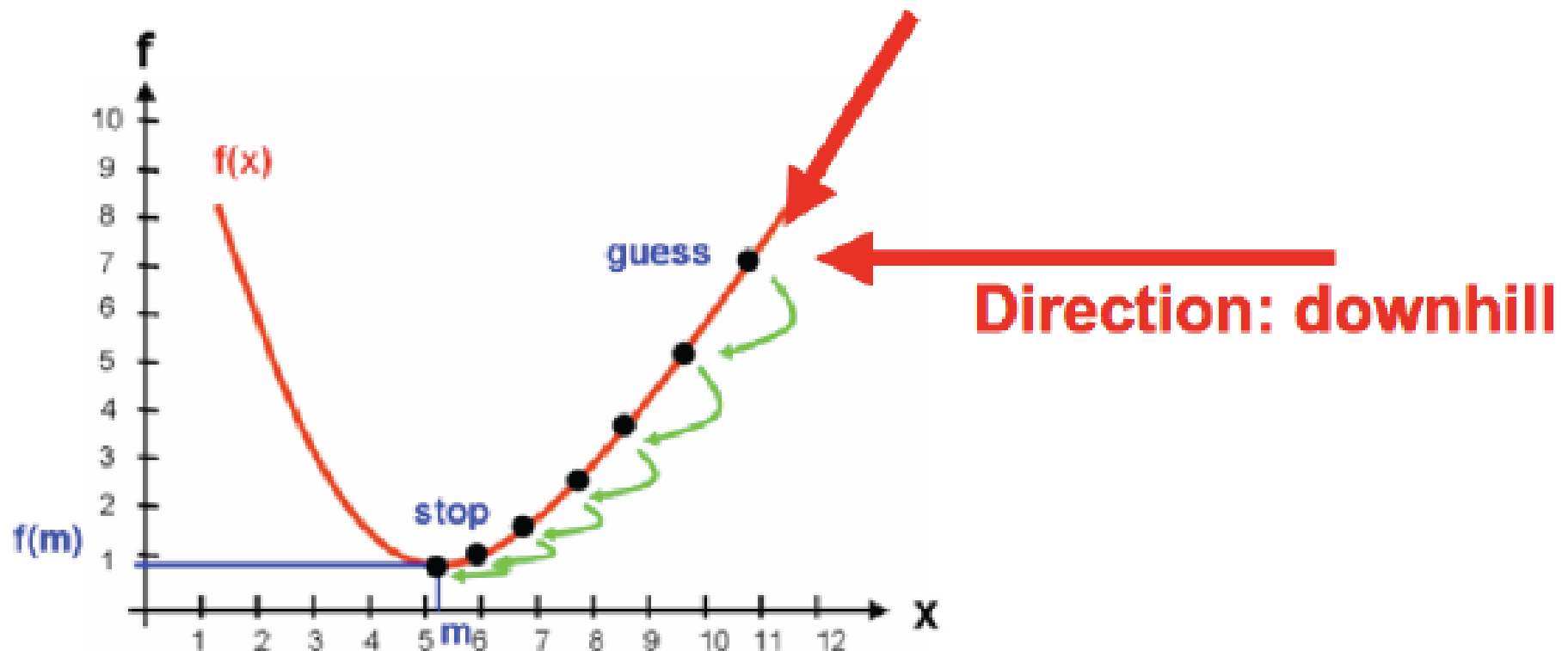
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



Start with a point (guess)

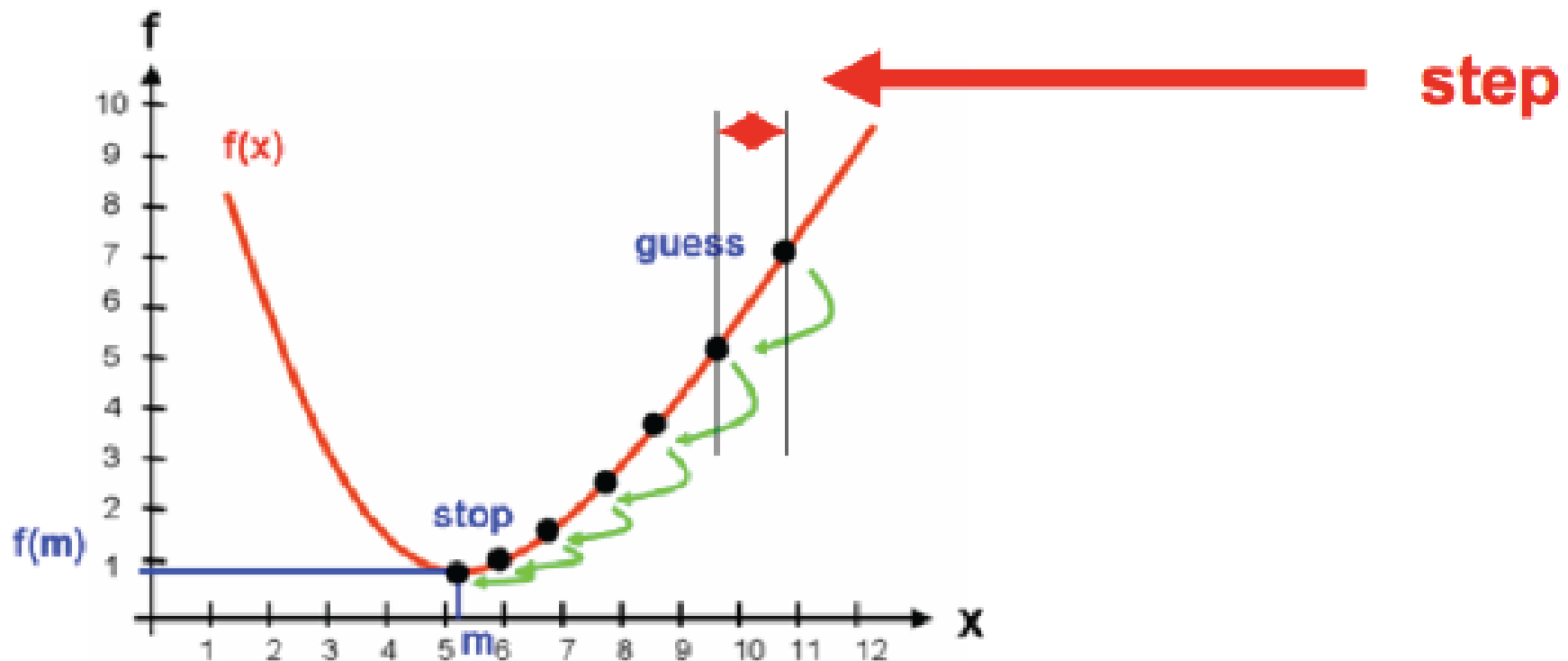
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



Start with a point (guess)

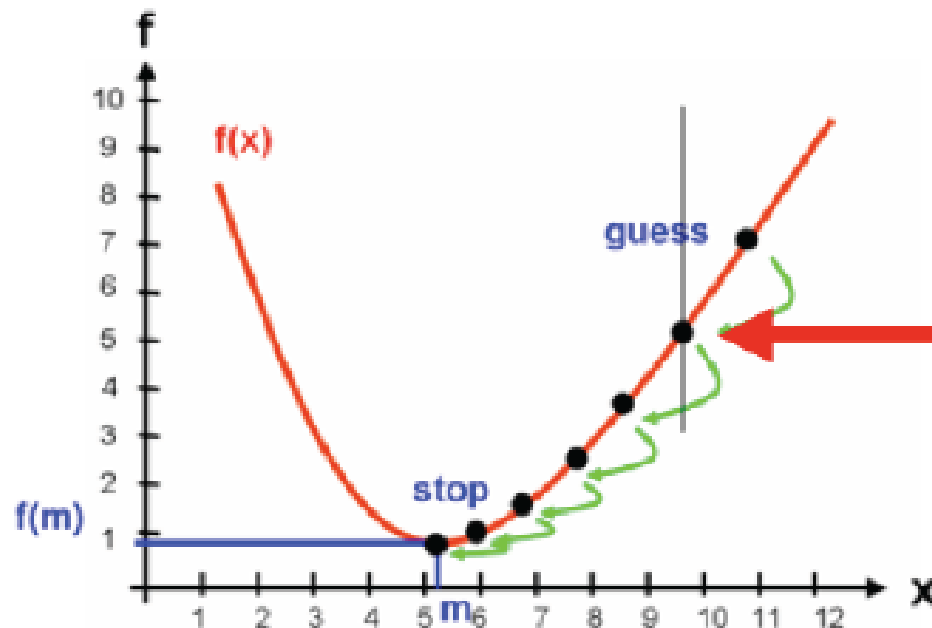
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



Start with a point (guess)

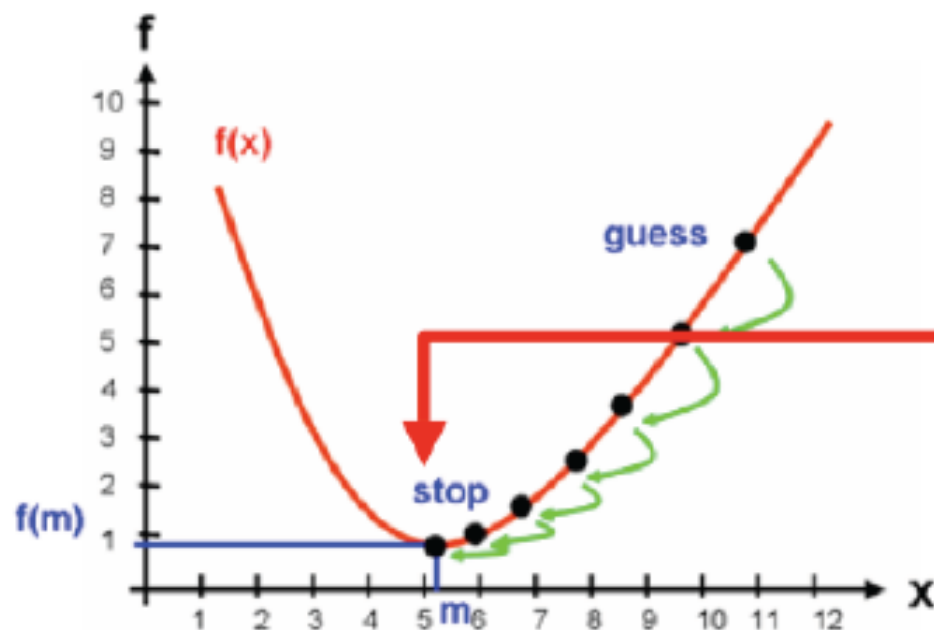
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



**Stop when “close”
from minimum**

Start with a point (guess)

Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied

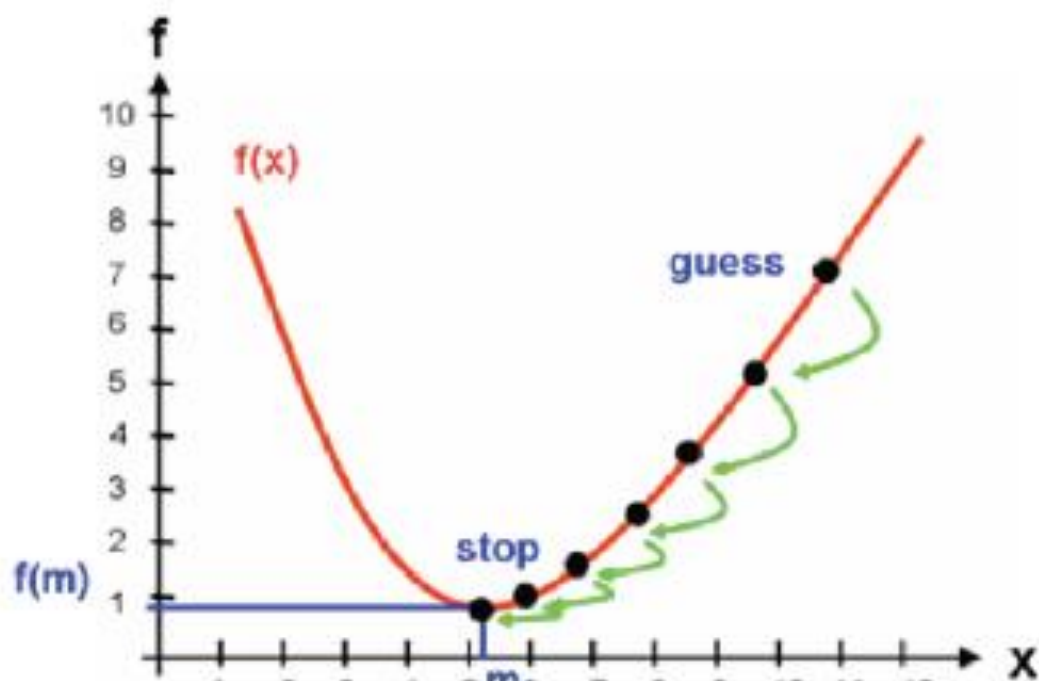
guess = x

direction = $-f'(x)$

step = $h > 0$

$x := x - hf'(x)$

$f'(x) \sim 0$



Generalization to multiple dimensions

Start with a point (guess)

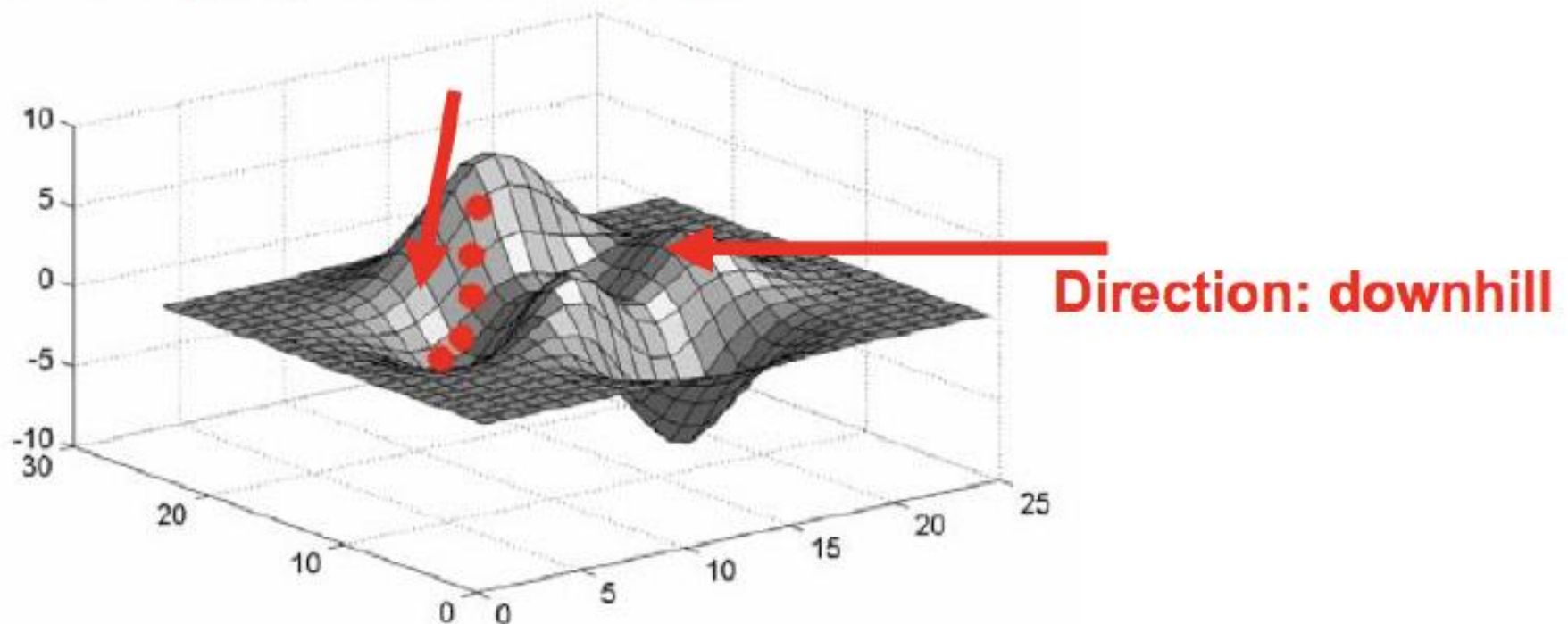
Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied



Generalization to multiple dimensions

Start with a point (guess)

Repeat

Determine a descent direction

Choose a step

Update

Until stopping criterion is satisfied

guess = x

direction = $-f'(x)$

step = $h > 0$

$x := x - h \nabla f'(x)$

$\nabla f'(x) \sim 0$

