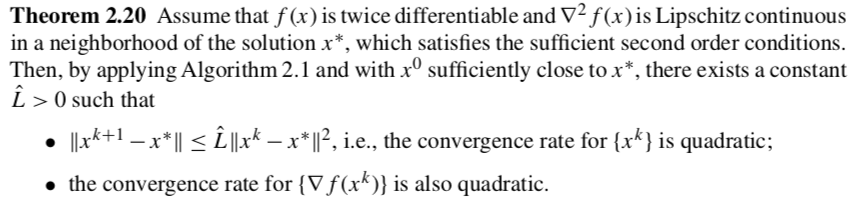
****

**Claim 1.** Convergence rate for is quadratic.

Step 1. What does continuity of second derivative tell us?

Step 2. Consider Newton step . Add to both sides.

Step 3. Work through algebra on RHS to obtain…

Step 4. Recall and apply to RHS.

Step 5. Take norms of both sides. Recall the Cauchy–Schwarz inequality .

Step 6. Invoke continuity properties (see Step 1).

**Claim 2.** Convergence rate for is quadratic.

Start with .

Step 1. Add to both sides.

Step 2. Take norm of both sides.

Step 3. Recall .

Step 4. Invoke Lipschitz continuity.

Step 5. Substitute

