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Exercises

1. Show that if  $X \geq Y$  then  $\text{trace}(X) \geq \text{trace}(Y)$ .
2. Verify remark 3.
3. Verify remark 4.
4. Let  $\Omega$  be a bounded domain in  $\mathbb{R}^N$  and let  $\delta(x) = \text{dist}(x, \partial\Omega)$ . Show that  $\delta(x) \in W_0^{1,\infty}(\Omega)$  and  $|\nabla\delta| = 1$  a.e.  $\Omega$ .