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# Homework #3

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<b>Problem 1</b>	2
<b>Problem 2</b>	2
<b>Problem 3</b>	2
<b>Problem 4</b>	2
<b>Problem 5</b>	2
<b>Problem 6</b>	2
<b>Problem 7</b>	2
<b>Problem 8</b>	2

**Problem 1**

If  $u \in L^p(\mathbb{R}^n)$  for  $1 \leq p < \infty$ , and  $u^\varepsilon = \eta_\varepsilon * u$ , for  $\eta_\varepsilon$  the standard mollifier. Show that

$$u^\varepsilon \rightarrow u$$

in  $L^p(\mathbb{R}^n)$  as  $\varepsilon \rightarrow 0$ .

*Proof.*

☐**Problem 2**

*Proof.*

☐**Problem 3**

*Proof.*

☐**Problem 4**

*Proof.*

☐**Problem 5**

*Proof.*

☐**Problem 6**

*Proof.*

☐**Problem 7**

*Proof.*

☐**Problem 8**

*Proof.*

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