HW 6 Solutions

Problem 1:

<table>
<thead>
<tr>
<th>In</th>
<th>Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>x</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

desired behavior

$E_n = 0, \quad I_n = 0$:

$E_n = 0 \Rightarrow$ output of NAND = 1 regardless of $I_n$
$E_n = 0, \quad I_n = 1 \Rightarrow$ output of NOR = 0 regardless of $I_n$

"1" turns PFE off
"0" turns NFET off

$\Rightarrow$

Last floats $= \text{high Z state}$
if $En = 1$ and $In = 0$,
node $A = 1$ and node $B = 1$
PFET is off and NFET is on, so

$En = 1$

If $En = 1$ and $In = 1$
node $A = 0$ and node $B = 0$
PFFT is on and NFET is off
so $out = 1 = In$
Problem 2:

| 5 | \( \times \) | 3 | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) | \( \Rightarrow \) |

\( \text{Out}_1 \)

\( \text{Out}_0 \)