CAN 'OUT' EVER BE A 1?

1. Logic function allows
2. Different # of FFs
3. Final FF's initial value.
4. Input FFs tick 
   decide differently
   out of 4 FFs

\[ D = A + B \oplus C \]
\[ D = \overline{A} \oplus C \]

**NOTES:**
- \( T_{\text{setup \\& hold}} = 0.1 \text{ ns} \)
- \( \text{CLOCK} \rightarrow Q = 1.0 \text{ ns} \)
- \( \text{ALL GATE DELAYS} = 1.0 \text{ ns} \)
- \( \text{CLOCK PERIOD} = 100 \text{ ns} \)

**DIAGRAM:**
A diagram of a digital circuit with labeled gates and connections.
Reduce the following Boolean expression to a minimal sum of products form:

\[ F = \overline{A} + \overline{B} + \overline{A} \overline{B} \]

\[ = (\overline{A} + \overline{B}) \cdot (\overline{A} \overline{B}) \]

\[ = \overline{A} \overline{B} = \overline{A + B} \]

\[ \& \]
Design a 4-bit complex binary counter with the following function, implement it.

<table>
<thead>
<tr>
<th>Load Count</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$Q = \text{old } Q$</td>
</tr>
<tr>
<td>1</td>
<td>Load Parallel</td>
</tr>
<tr>
<td>1</td>
<td>Up Count</td>
</tr>
<tr>
<td>1</td>
<td>Down Count</td>
</tr>
</tbody>
</table>

HW # 6A
Which of the following is the right syntax for blocking/non-blocking assignments?

Circle all correct answers.

a) assign ps = A;

b) assign ps <= A;

c) always_comb begin
   if (reset)
     end ps = A;

d) always_comb begin
   if (reset)
     ps <= A;

e) always_ff @(posedge clk) begin
   case (in)
     'b0 : ps = A;
   endcase

f) always_ff @(posedge clk) begin
   case (in)
     'b0 : ps <= A;
   endcase
HW # 6A

1. Design: Make a $\wedge \lor \bar{K}$ gate using one 2:1 mux. Use as many basic gates as needed, but your circuit must be as simple as possible.