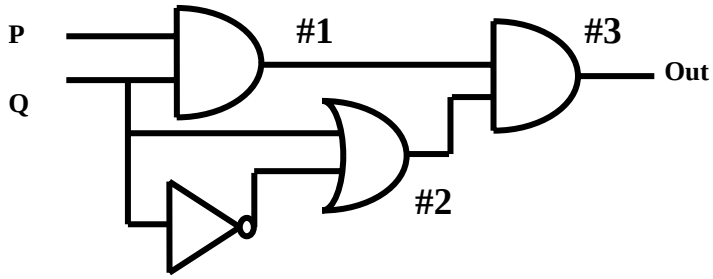
Answers (Truth Tables) to Logic Diagram Review Problems

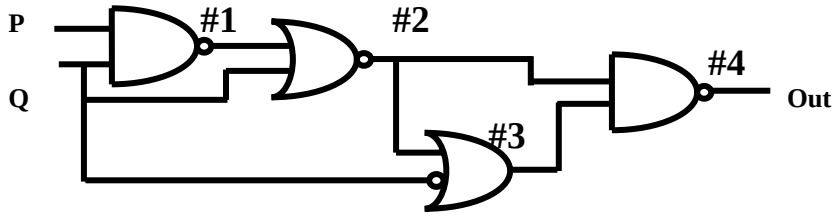
Figure B.



P Q	#1 P•Q	#2 Q+$\overline{Q}$	#3 (#1)•(#2)
0 0	0	1	0
0 1	0	1	0
1 0	0	1	0
1 1	1	1	1

Answer: P•Q

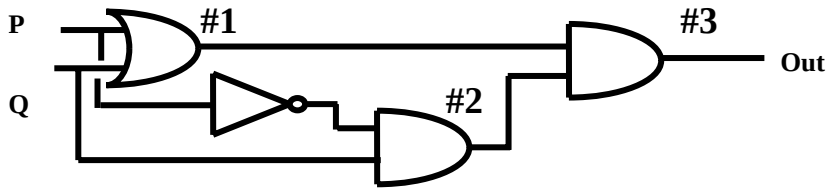
Figure C.



P Q	#1 $\overline{P•Q}$	#2 $\overline{\#1+Q}$	#3 #2+$\overline{Q}$	#4 $\overline{(\#2)•(\#3)}$
0 0	1	0	1	1
0 1	1	0	0	1
1 0	1	0	1	1
1 1	0	0	0	1

Answer: 1

Figure D.

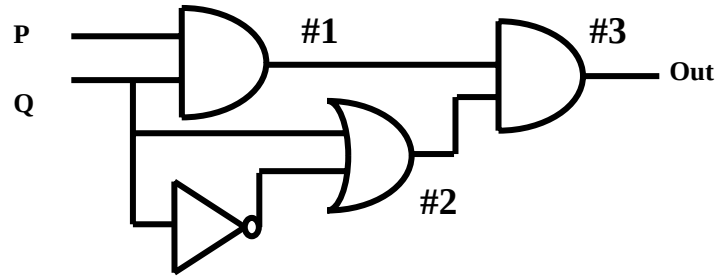


P Q	#1 P + Q	#2 $\overline{P}$•Q	#3 #1•#2
0 0	0	0	0
0 1	1	1	1
1 0	1	0	0
1 1	1	0	0

Answer: $\overline{P}$•Q

Answers (Boolean Equations) to Logic Diagram Review Problems

Figure B.

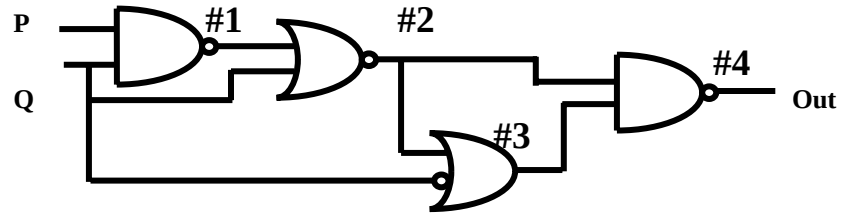


#1 $P \bullet Q$

#2 $Q + \overline{Q} = 1$

#3 $(P \bullet Q) \bullet (1) = P \bullet Q$ **Answer: P•Q**

Figure C.



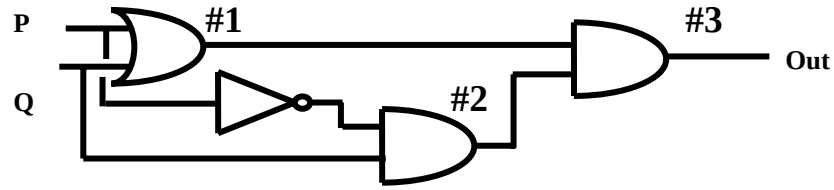
#1 $\overline{P \bullet Q}$

#2 $\overline{P \bullet Q} + Q = (P \bullet Q) \bullet \overline{Q} = P \bullet Q \bullet \overline{Q} = P \bullet 0 = 0$

#3 $0 + \overline{Q} = \overline{Q}$

#4 $\overline{0 \bullet \overline{Q}} = 1 + Q = 1$ **Answer: 1**

Figure D.



#1 $P + Q$

#2 $\overline{P} \bullet Q$

*** #3 $(P + Q) \bullet (\overline{P} \bullet Q) = (\overline{P} \bullet Q) \bullet (P + Q) = (\overline{P} \bullet Q) \bullet P + (\overline{P} \bullet Q) \bullet Q = \overline{P} \bullet P \bullet Q + \overline{P} \bullet Q \bullet Q = 0 \bullet Q + \overline{P} \bullet Q = 0 + \overline{P} \bullet Q = \overline{P} \bullet Q$

*** From Boolean Algebra Properties: $A(B + C) = AB + AC$

$A(B + C) = AB + AC$ where $A = \overline{P} \bullet Q \quad B = P \quad C = Q$
$(\overline{P} \bullet Q) \bullet (P + Q) = (\overline{P} \bullet Q) \bullet P + (\overline{P} \bullet Q) \bullet Q = \overline{P} \bullet P \bullet Q + \overline{P} \bullet Q \bullet Q = 0 \bullet Q + \overline{P} \bullet Q = 0 + \overline{P} \bullet Q = \overline{P} \bullet Q$ **Answer: $\overline{P} \bullet Q$**