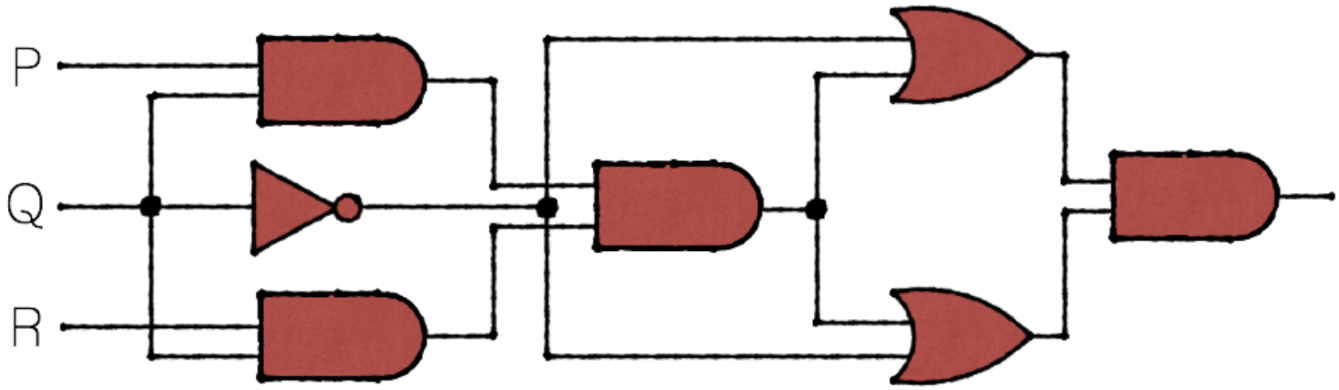
Find the output (boolean expression) for the circuit below (without simplifying):

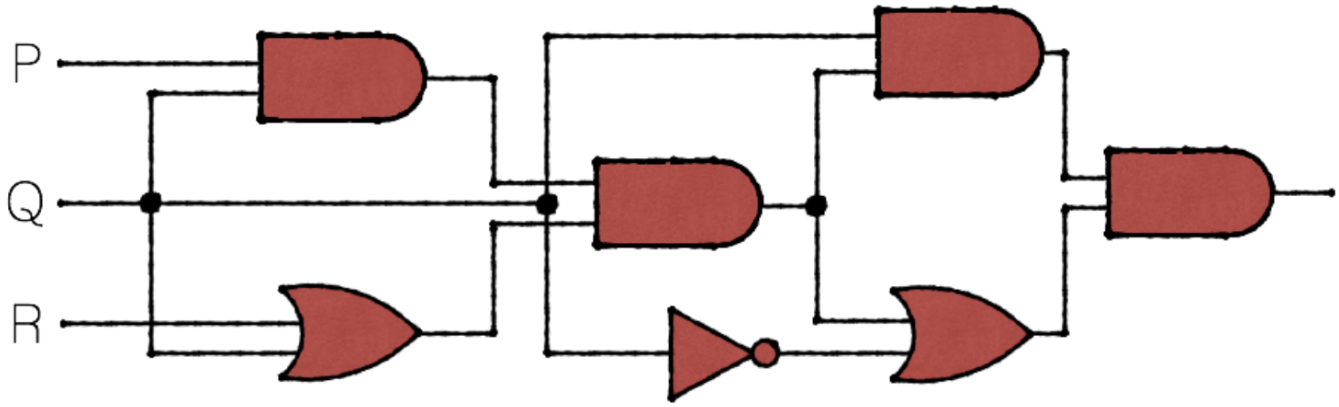


(((P.Q).(Q.R))+~Q).(((P.Q).(Q.R))+~Q)

What is the number of control/select wires for an 8-1 multiplexer?

3

Find the output (boolean expression) for the circuit below (without simplifying):



(((P.Q).(Q+R)).Q).(((P.Q).(Q+R))+~Q)

The variables p, q, and s have the following truth values: p = True, q = True, s = False. What's the truth value for the following boolean expressions:

p + ~q

True

The variables p, q, and s have the following truth values: p = True, q = True, s = False. What's the truth value for the following boolean expressions:

(p . q) + s

True

The variables p, q, and s have the following truth values: p = True, q = True, s = False. What's the truth value for the following boolean expressions:

p . (q + s)

True

The variables p, q, and s have the following truth values: p = True, q = True, s = False. What's the truth value for the following boolean expressions:

p + ~(q . s)

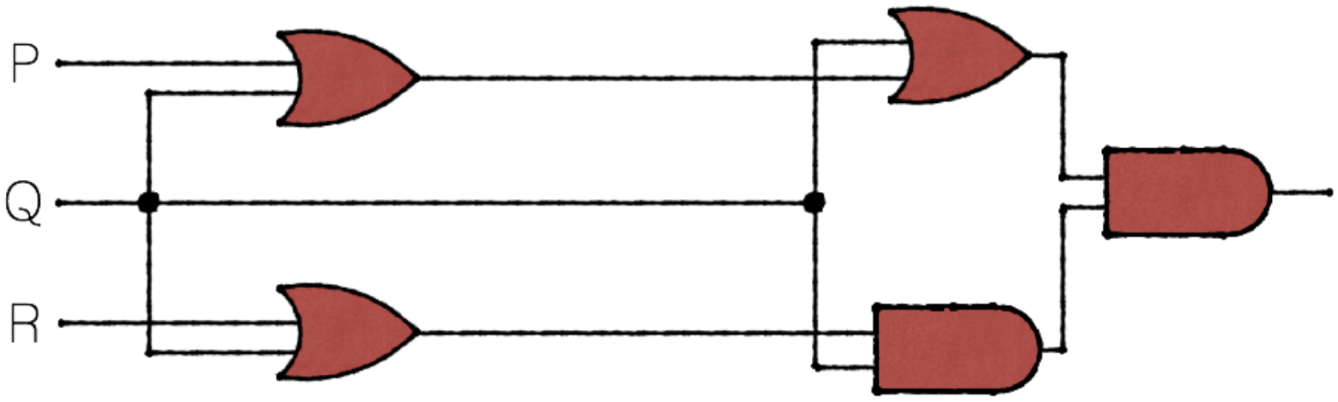
True

The variables p, q, and s have the following truth values: p = True, q = True, s = False. What's the truth value for the following boolean expressions:

~(q . p . ~s)

False

Find the output (boolean expression) for the circuit below (without simplifying):



((P+Q)+Q).((Q+R).Q)

How many two-input AND gates are required to realize:

Y = C . D + E . F + G

2

How many two-input AND gates and two-input OR gates are required to realize:

Y = B . D + C . E + A . B

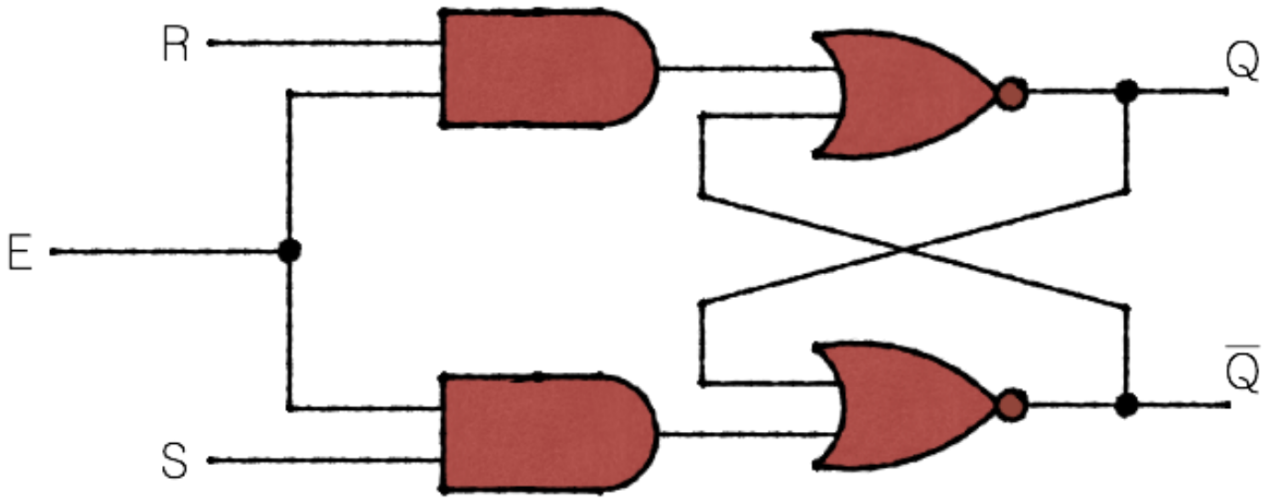
3 AND, 2 OR

Find the boolean expression that describes '?' (without simplifying)

p	q	s	?
0	0	0	0
0	1	1	0
0	1	0	1
0	0	1	1
1	0	0	1
1	1	1	1
1	1	0	0
1	0	1	0

~p.q.~s + ~p.~q.s + p.~q.~s + p.q.s

The diagram below is called a 'Gated SR Latch' circuit, built from 'NOR's and 'AND's. Provide the Q value for the 1st, 2nd, 3rd, and 4th state.



State	R	E	S	Q
1st State	1	1	0	?
2nd State	0	1	0	?
3rd State	0	1	1	?
4th State	1	1	0	?

1st State = 0, 2nd State = 0, 3rd State = 1, 4th State = 0