

# Toffoli circuit

**Represent the following circuit expressed using the Qiskit notation in Quirk (<https://algassert.com/quirk>) and answer the questions in this form.**

```
from qiskit import QuantumRegister, ClassicalRegister, QuantumCircuit
```

```
qreg_q = QuantumRegister(13, 'q')
creg_c = ClassicalRegister(4, 'c')
circuit = QuantumCircuit(qreg_q, creg_c)

circuit.h(qreg_q[3])
circuit.h(qreg_q[9])
circuit.h(qreg_q[12])
circuit.h(qreg_q[6])
circuit.h(qreg_q[8])
circuit.ch(qreg_q[7], qreg_q[3])
circuit.ccx(qreg_q[10], qreg_q[11], qreg_q[12])
circuit.ccx(qreg_q[3], qreg_q[4], qreg_q[0])
circuit.ccx(qreg_q[1], qreg_q[3], qreg_q[6])
circuit.ccx(qreg_q[0], qreg_q[3], qreg_q[7])
circuit.cs(qreg_q[1], qreg_q[3])
circuit.cz(qreg_q[7], qreg_q[3])
circuit.cx(qreg_q[3], qreg_q[7])
circuit.swap(qreg_q[3], qreg_q[7])
circuit.ch(qreg_q[5], qreg_q[3])
circuit.ch(qreg_q[3], qreg_q[2])
circuit.ccx(qreg_q[5], qreg_q[6], qreg_q[7])
circuit.measure(qreg_q[3], creg_c[3])
circuit.measure(qreg_q[2], creg_c[2])
circuit.measure(qreg_q[7], creg_c[3])
circuit.measure(qreg_q[8], creg_c[3])
circuit.measure(qreg_q[9], creg_c[3])
circuit.measure(qreg_q[12], creg_c[3])
```

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**\* Indica que la pregunta es obligatoria**

1. Enter your experimental ID \*

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2. Which is the percentage value of  $\text{mag}^2$  for the state 64 (decimal)? (e.g., 32.7) \*

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3. Which is the percentage value of  $\text{mag}^2$  for the state 456 (decimal)? (e.g., 32.7) \*

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4. Which is the percentage value of  $\text{mag}^2$  for the state 972 (decimal)? (e.g., 32.7) \*

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5. Which is the percentage value of  $\text{mag}^2$  for the state 2190 (decimal)? (e.g., 32.7) \*

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6. Which is the percentage value of  $\text{mag}^2$  for the state 3401 (decimal)? (e.g., 32.7) \*

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7. Which is the percentage value of  $\text{mag}^2$  for the state 4236 (decimal)? (e.g., 32.7) \*

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8. Which is the percentage value of  $\text{mag}^2$  for the state 5998 (decimal)? (e.g., 32.7) \*

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9. Which is the percentage value of  $\text{mag}^2$  for the state 7457 (decimal)? (e.g., 32.7) \*

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10. Copy the code of the circuit created (Export button, then 'Copy to clipboard' under 'Escaped Link') \*

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