# InFINIte Robotics - Guide

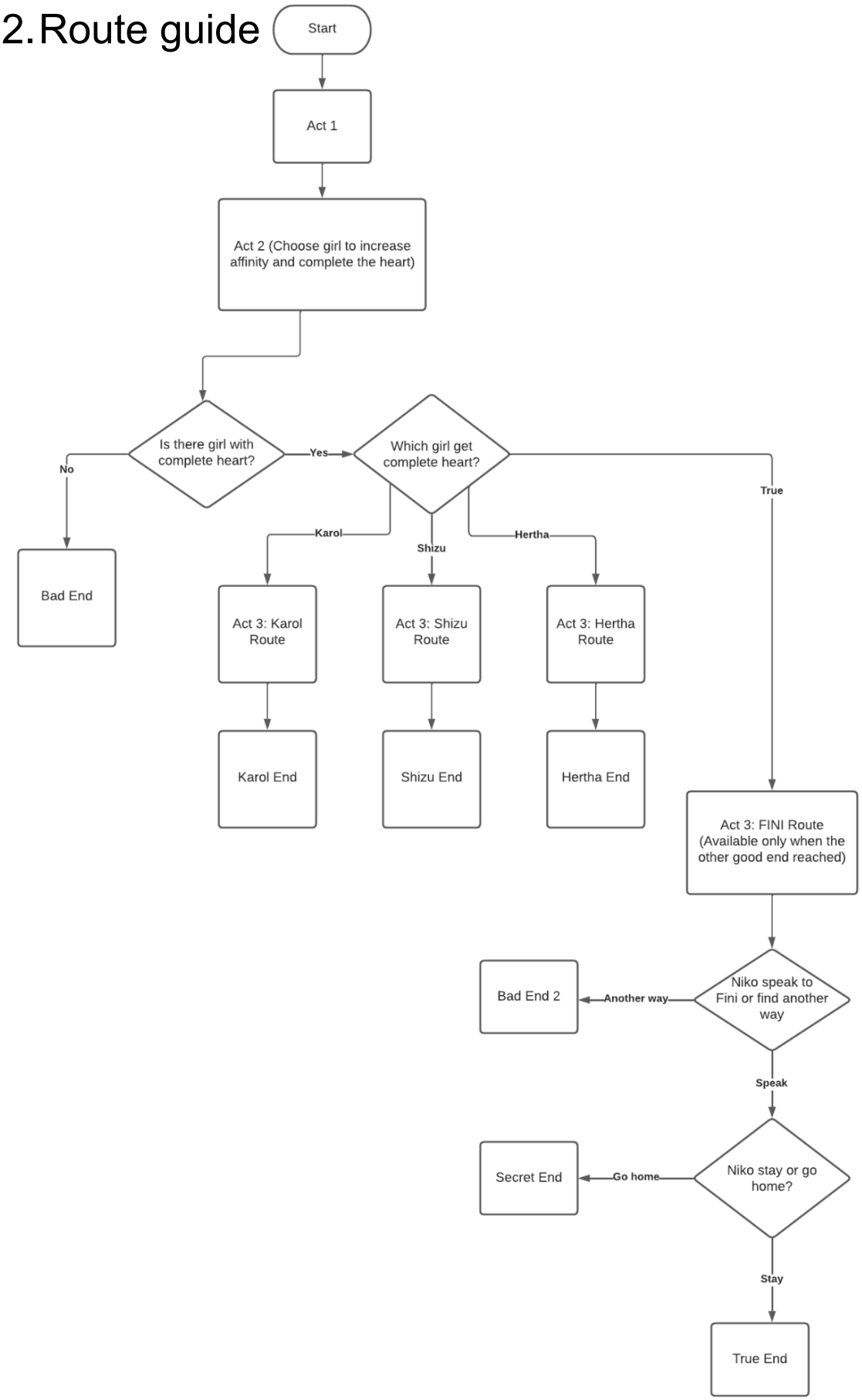
Table of contents:


1. Introduction 1
2. Route guide 2
3. Act 1, Chapter 1: Series & Parallel bulb 3
4. Act 1, Chapter 2: Resistor colour code 4
5. Act 1, Chapter 4: Resistor series & parallel 4
6. Act 2, Karol Chapter 2: Simple Kirchoff circuit 6
7. Act 2, Chapter 3: (Q&A) Hand crank generator 7
8. Act 3, Fini Chapter 2: Logic gates 8


## 1. Introduction

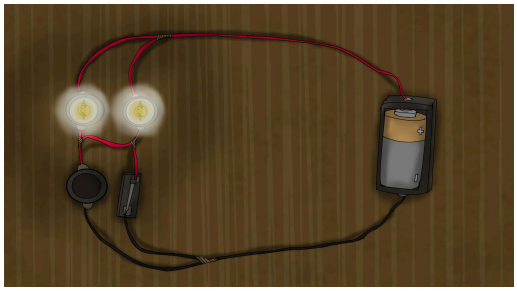
This is a guide manual for InFINIte Robotics Visual Novel game. It will spoil some parts of the game. This game will focus on how to solve the puzzle in the game also with some simplified technical explanation. This guide also explains how to reach the endings and routes of the game.

# 2. Route guide

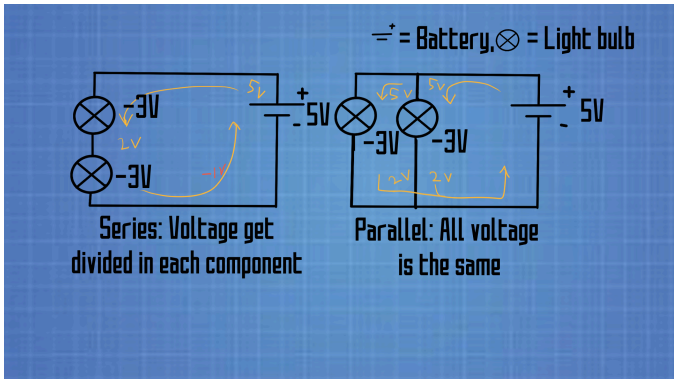


# 3. Act 1, Chapter 1: Series & Parallel bulb

Problem: How to make the two light bulb lights with the same brightness and light intensity?
Answer: Parallel

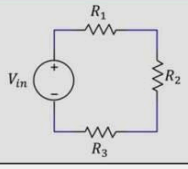
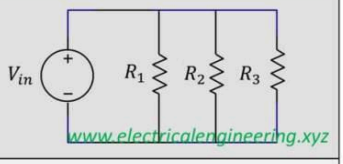


Explanation:




As seen before in the VN, the difference between series and parallel is the voltage in series divided in each component, while in parallel, the voltage is exactly the same. So for example a lamp that needs 3V to light up, will give the same brightness if it is placed parallel since there's no voltage loss.

Notes: Other than voltage, The current is also different between parallel and series circuits. However, the difference is the opposite of voltage. In series, the current is the same for all components, while in parallel, the current is divided in each component. Please see the summary image below to understand more: (Reference: www.electricalengineering.xyz)

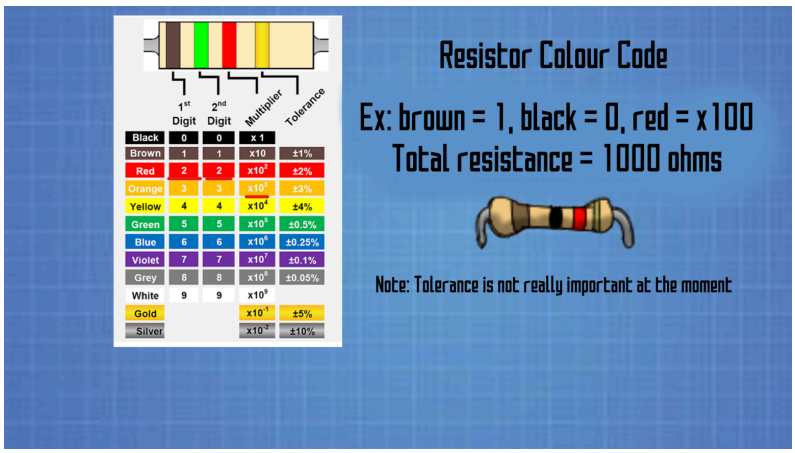
| | Series | Parallel |
|---|---|---|
| How it looks |  |  |
| Voltage | $V_{in} = V_1 + V_2 + V_3$ | $V_{in} = V_1 = V_2 = V_3$ |
| Current | $I_{series} = I_1 = I_2 = I_3$ | $I_{in} = I_1 + I_2 + I_3$ |
| Resistance | $R_{eq} = R_1 + R_2 + R_3$ | $\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ |

# 4. Act 1, Chapter 2: Resistor colour code

Problem: which one of the resistors is 22k ohm?
Answer: Red, red, orange (22k ohm)



Explanation:



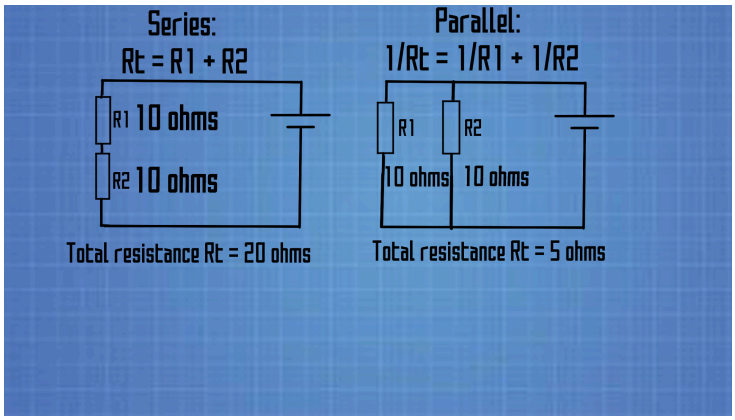

The answer is red = 2, red = 2, orange = 10^3. So the total resistance is 22x10^3 which is 22000 ohms or 22k ohms.

# 5. Act 1, Chapter 4: Resistor series & parallel

Problem: which one of the resistors can replace 600ohm?
Answer: Brown, red, red (1.2kohm)

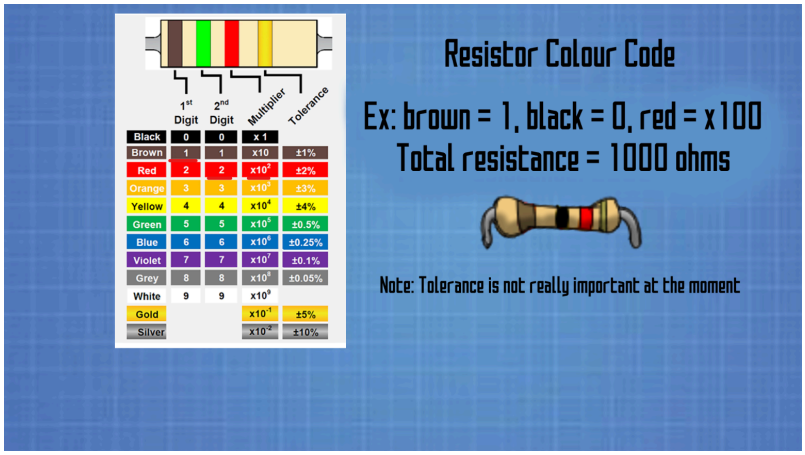


Explanation:
Niko mentioned that all of the resistors have high resistance, so the only way is to make it in parallel to reduce the resistance and get 600 ohms. We need to know first the formula of the series & parallel circuit for resistors.




So from the formula: $1/R_t = 1/R_1 + 1/R_2$, we know that the $R_t$ is 600 ohms, and we will likely have the same resistor so $R_1 = R_2$, so our equation is:
$1/600 = 1/R_1 + 1/R_1$, so we add it to become:
$1/600 = 2/R_1$, then we cross multiply:
$R_1 = 2x600$, then we multiply:
$R_1 = 1200$, so the answer is 1200 ohms

From there we use our previous knowledge of colour-coded resistor

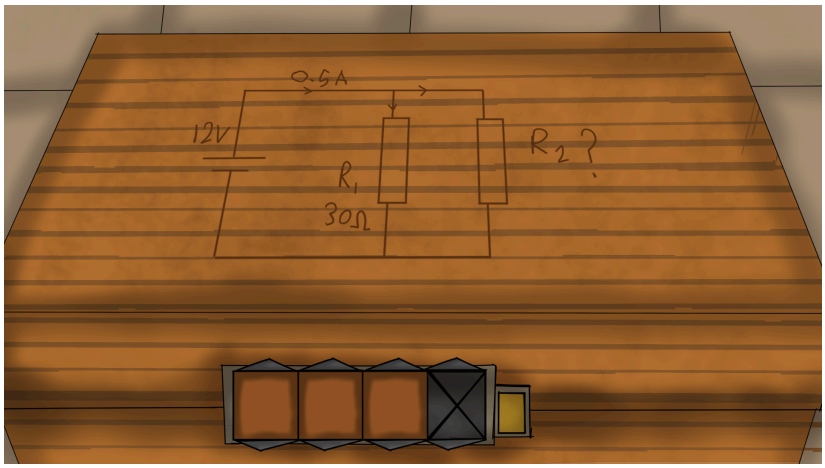



And so we get the answer which is brown = 1, red = 2, red = 10^2. So the total resistance is 12x10^2 which is 1200 ohms or 1.2k ohms.

Notes: It's actually easier to think of it as a series and add 600 ohms with 600 ohms, since we know that the resistors will be the same and it's only 2 components.

# 6. Act 2, Karol Chapter 2: Simple Kirchoff circuit

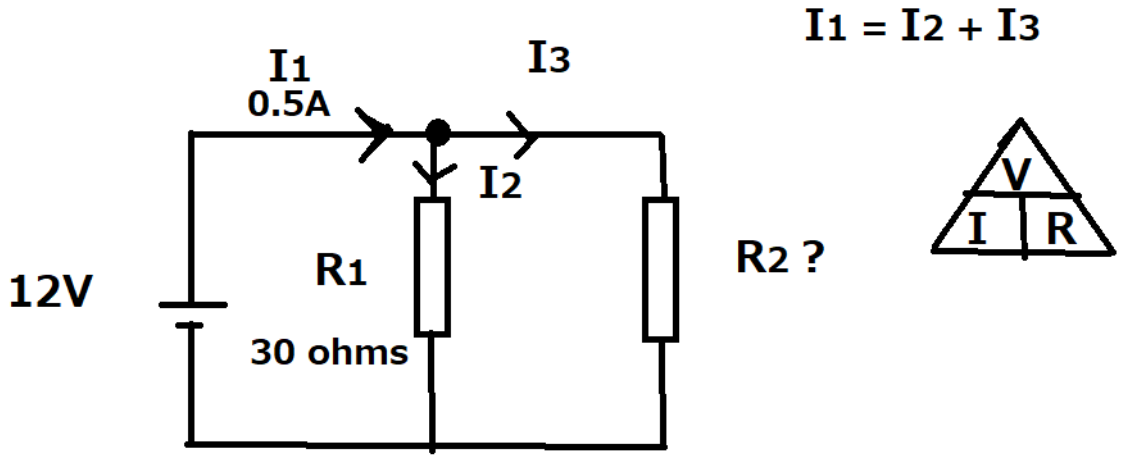
Problem: Solve this problem and find the resistor?




Answer: 120 ohm (brown, red, brown)

Explanation:

To find $R_2$, there are a few ways to do this. But first, better give some indication of the current like in the picture below:




According to Kirchoff's law, if we see the node, $I_1 = I_2 + I_3$, since the current will be divided in parallel. We also know the most important law which is Ohm's law which is V=RxI. From these, we can solve $I_2$. Since we know $R_1$ which is 30 ohms, and V which is 12V, since in a parallel circuit the voltage is the same. So using the re-arrange Ohm's law which is I=V/R, we can get the equation for $I_2$ which is:

$I_2 = 12/30$, we multiply this become:

$I_2 = 0.4$

Now we can solve $I_3$ by re-arrange the Kirchoff formula to become:

$I_3 = I_1 - I_2$, and after we add the known value, $I_1 = 0.5$ A and $I_2 = 0.4$ A:

$I_3 = 0.5 - 0.4$, so $I_3$ becomes:

$I_3 = 0.1$

From here we can finally solve $R_2$ using a re-arrange Ohm's law which is:
$R_2 = V/I_3$, then we put the values:
$R_2 = 12/0.1$
R2 = 120, so the answer is 120 ohms.
And from the colour-coded graph, we will get brown, red, brown.

Notes: To be fair, this question is a lot harder at first, but then I figured that not everyone is good at math. This is also the main problem when creating this VN, since there's not exactly an audience for this kind of stuff so at the end I decided to make the question easily understandable for everyone, hopefully.

# 7. Act 2, Chapter 3: (Q&A) Hand crank generator

Problem1:What is the component that is able to create or amplify electricity?
Answer: Inductor
Explanation: Inductor is actually just a bunch of copper wires coiled up together, and it was used to store electrical energy in a magnetic field. However when there's magnetic energy near the coils, then…

Problem2: Inductor coils can't just create electricity, what component is needed to make this electric field?
Answer: Moving Magnet
Explanation: As the terms said, Electromagnetic Induction. This is a relationship between magnetism and electricity. As the magnet moves towards the coils, it generates currents through the wires coils, this is according to Faradays's Law.

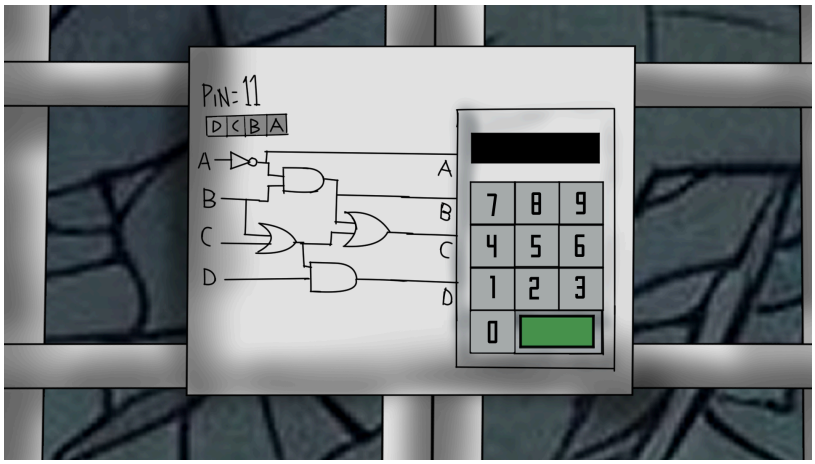
Problem3: What component stores the electric field like a battery?
Answer: Capacitor
Explanation: Inductors store energy in a magnetic field, and capacitors on the other hand store it in electric fields. Why do we need a capacitor in this circuit, is so that we will always get a constant flow of voltage from the generator and reduce noise.

Problem4: What component forces the electrical current to move in one direction?
Answer: Diode
Explanation: Diode acts as a rectifier and provides a positive voltage to the output, so there's no negative feedback voltage flowing to the generator.

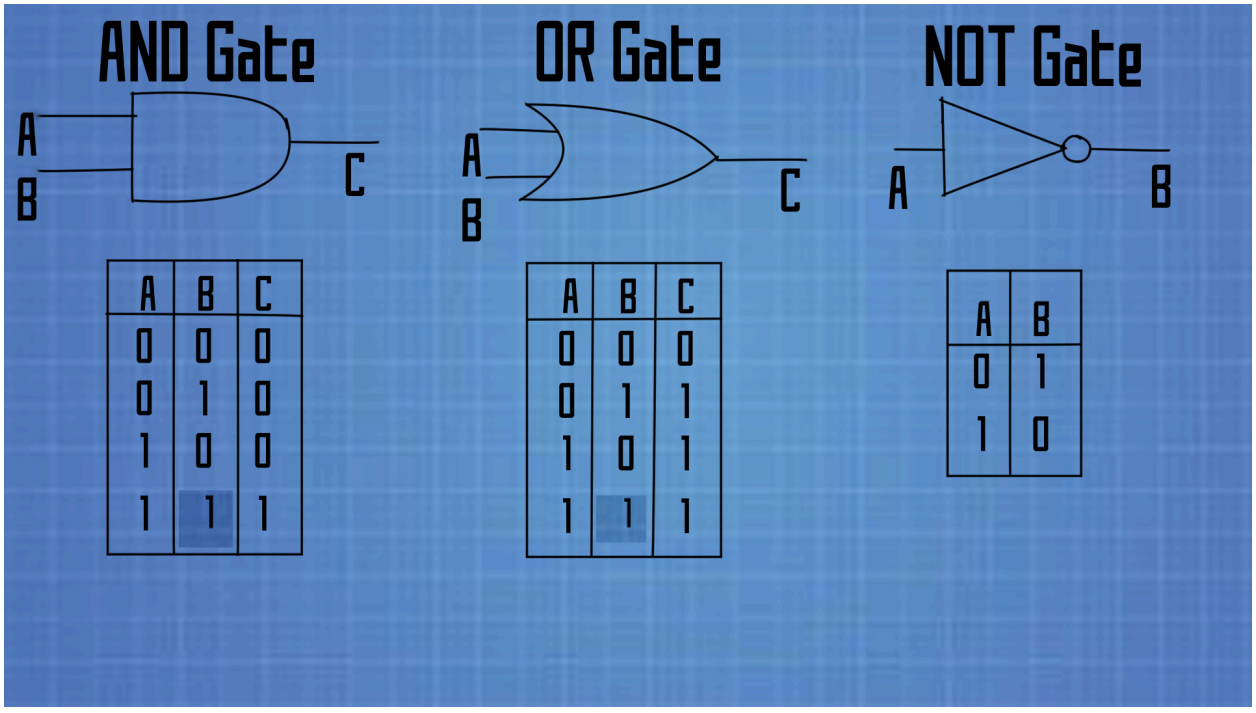
Note: All of these components were learned and hinted at in each Heroine path, so I really recommend playing each route. Before I wanted to think of a way to make it more difficult but a general question so players don't need to play all routes, but at the end I think this is way better. So that player will willing to learn other routes too (hopefully lol).

# 8. Act 3, Fini Chapter 2: Logic gates

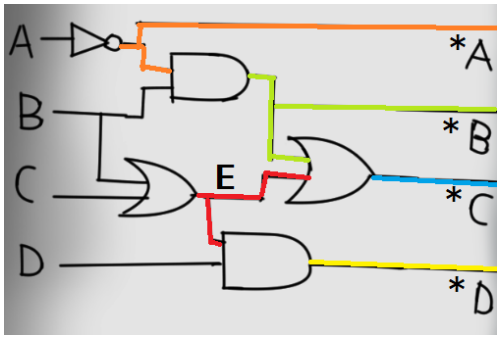
Problem: Solve the logic circuit and give the output binary/decimal in the keypad?




Answer: Binary: 1100, Final Answer decimal for keypad: 12
Explanation:
In the VN, we know the logic gates theory truth table which is:




From here we know how to solve this puzzle. The formal way to do this is by doing a truth table. Before making the truth table, first, we need to make more indications to the signals to make things easier like in the picture below:




Then we also get a clue for the input which is 11, this is most likely be decimal number, so we need to convert this to binary which is 1011. Then after we put that into a truth table,
So the truth table for the logic circuits will be: (The answer is the highlighted rows)

| Input decimal | Input binary | | | | Signal between | Output binary | | | | Output decimal |
|---|---|---|---|---|---|---|---|---|---|---|
| | D | C | B | A | E | *D | *C | *B | *A | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 7 |
| 3 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 4 |
| 4 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 5 |
| 5 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 4 |
| 6 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 7 |
| 7 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 4 |
| 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 9 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 15 |
| 11 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 12 |
| 12 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 13 |
| 13 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 12 |
| 14 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 15 |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 12 |

Notes & Thanks: Well I guess that’s it, I am thinking of a few more electronic puzzles, but think these are already a lot, especially for newbies. Thank you again for playing my game and checking this. I hope this gives you an interest in the world of electronics!