

## Goals:

- To utilize maximum effort and thought to engage with the material from chapter 3 for the purpose of creating a highly organized document demonstrating mastery of the ideas and material in this chapter in a compelling and meaningful way.
- Also, to get an A on it, which requires great thought, organization, and effort.

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*Part 1: Statements*

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- A) Find a complex political, philosophical, literary, or popular culture statement. This statement will need to contain a (at least two (conjunctions OR disjunctions) AND a conditional statement) OR (at least four conjunctions OR disjunctions OR negations where you utilize at least two different connectives).

Type out this argument, if the quote comes from a video, transcribe it and provide a link to the video clip.

I am using a song lyric from the song "A Boy Named Sue" by Johnny Cash.

<https://www.youtube.com/watch?v=WOHPuY88Ry4>

The lyrics are below:

Well my daddy left home when I was three  
And he didn't leave much to Ma and me  
Just this old guitar and an empty bottle of booze  
Now, I don't blame him 'cause he run and hid  
But the meanest thing that he ever did  
Was before he left, he went and named me "Sue"

Well, he must o' thought that is quite a joke  
And it got a lot of laughs from a' lots of folk  
It seems I had to fight my whole life through  
Some gal would giggle and I'd get red  
And some guy'd laugh and I'd bust his head  
I tell ya, life ain't easy for a boy named "Sue"

Well, I grew up quick and I grew up mean  
My fist got hard and my wits got keen  
Roam from town to town to hide my shame  
But I made me a vow to the moon and stars  
I'd search the honky-tonks and bars  
And kill that man who gave me that awful name

Well, it was Gatlinburg in mid-July  
And I just hit town and my throat was dry  
I thought I'd stop and have myself a brew  
At an old saloon on a street of mud  
There at a table, dealing stud  
Sat the dirty, mangy dog that named me "Sue"

Well, I knew that snake was my own sweet dad  
From a worn-out picture that my mother'd had  
And I knew that scar on his cheek and his evil eye  
He was big and bent and gray and old  
And I looked at him and my blood ran cold  
And I said: "My name is 'Sue!' How do you do!?"  
Now you gonna die!"  
Yeah that's what I told 'em

Well, I hit him hard right between the eyes  
And he went down, but to my surprise  
He come up with a knife and cut off a piece of my ear  
But I busted a chair right across his teeth  
And we crashed through the wall and into the street  
Kicking and a' gouging in the mud and the blood and the beer

I tell ya, I've fought tougher men  
But I really can't remember when  
He kicked like a mule and he bit like a crocodile  
I heard him laugh and then I heard him cuss  
He went for his gun and I pulled mine first  
He stood there lookin' at me and I saw him smile

And he said, "Son, this world is rough  
And if a man's gonna make it, he's gotta be tough  
And I know I wouldn't be there to help ya along  
So I give ya that name and I said goodbye  
I knew you'd have to get tough or die  
And it's the name that helped to make you strong"

Yeah he said, "Now you just fought one hell of a fight  
And I know you hate me, and you got the right  
To kill me now, and I wouldn't blame you if you do  
But ya ought to thank me, before I die  
For the gravel in ya guts and the spit in ya eye  
'Cause I'm the son-of-a-bitch that named you "Sue"

Yeah what could I do, what could I do  
I got all choked up and I threw down my gun  
Called him my Pa, and he called me his son  
And I come away with a different point of view  
And I think about him, now and then  
Every time I try and every time I win  
And if I ever have a son, I think I'm gonna name him  
Bill or George! Anything but Sue! I still hate that name! Yeah

The lyric I will use for my statement is:

He stood there lookin' at me and I saw him smile

And he said, "Son, this world is rough  
And if a man's gonna make it, he's gotta be tough  
And I know I wouldn't be there to help ya along

- B) Using variables and let statements, deconstruct your statement into its equivalent symbolic logical form.  
(make sure each statement is capable of being classified as T or F)

Let  $x$  = He stood there lookin' at me  
 $y$  = I saw him smile  
 $p$  = If a man's gonna make it in this rough world  
 $q$  = he's gotta' be tough  
 $r$  = I know I'd be there to help you along

**Equivalent logical form:  $(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$**

- C) Look up, research, and show evidence for your justification for the truth value of each of your component statements.

**T:**  $x$  = He stood there lookin' at me  
 we have no reason to believe this is false, no eye witnesses could be located ☺

**T:**  $y$  = I saw him smile  
 again, we have no reason to believe this is false

**T:**  $p$  = If a man's gonna make it in this rough world  
 subjective opinion but agreed

**F/T:**  $q$  = he's gotta' be tough  
 Assuming we are speaking of pure physicality, this may be true in Sue's life, but it is not true for all lives, so F.  
 However, if we speak in general terms of "tough things" as things that are still living, then all living things are tough. This definition is supported in the lyric "I knew you'd have to get tough or die" so by this definition, an argument could be made for T.

**F:**  $r$  = I know I'd be there to help you along  
 False, he knew he would not be there.

I would like to consider both options for statement  $q$ .

option 1 (case 2):  $q$  = he's gotta be tough, is F (highlighted in yellow)

option 2 (case 4):  $q$  = he's gotta be tough, is T (highlighted in orange)

D) Create a complete truth table which will assess all possible truth values for the statement.

Case	$x$	$y$	$p$	$q$	$r$	$\sim r$	$x \wedge y$	$p \rightarrow q$	$(x \wedge y) \wedge (p \rightarrow q)$	$(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$
1	T	T	T	T	T	F	T	T	T	F
2	T	T	T	T	F	T	T	T	T	T
3	T	T	T	F	T	F	T	F	F	F
4	T	T	T	F	F	T	T	F	F	F
5	T	T	F	T	T	F	T	T	T	F
6	T	T	F	T	F	T	T	T	T	T
7	T	T	F	F	T	F	T	T	T	F
8	T	T	F	F	F	T	T	T	T	T
9	T	F	T	T	T	F	F	T	F	F
10	T	F	T	T	F	T	F	T	F	F
11	T	F	T	F	T	F	F	F	F	F
12	T	F	T	F	F	T	F	F	F	F
13	T	F	F	T	T	F	F	T	F	F
14	T	F	F	T	F	T	F	T	F	F
15	T	F	F	F	T	F	F	T	F	F
16	T	F	F	F	F	T	F	T	F	F
17	F	T	T	T	T	F	F	T	F	F
18	F	T	T	T	F	T	F	T	F	F
19	F	T	T	F	T	F	F	F	F	F
20	F	T	T	F	F	T	F	F	F	F
21	F	T	F	T	T	F	F	T	F	F
22	F	T	F	T	F	T	F	T	F	F
23	F	T	F	F	T	F	F	T	F	F
24	F	T	F	F	F	T	F	T	F	F
25	F	F	T	T	T	F	F	T	F	F
26	F	F	T	T	F	T	F	T	F	F
27	F	F	T	F	T	F	F	F	F	F
28	F	F	T	F	F	T	F	F	F	F
29	F	F	F	T	T	F	F	T	F	F
30	F	F	F	T	F	T	F	T	F	F
31	F	F	F	F	T	F	F	T	F	F
32	F	F	F	F	F	T	F	T	F	F

E) Determine the truth value of your chosen statement by making clear your use of the truth tables. Be sure to include truth values for *every* compound statement as well as for your variables.

Case	$x$	$y$	$p$	$q$	$r$	$\sim r$	$x \wedge y$	$p \rightarrow q$	$(x \wedge y) \wedge (p \rightarrow q)$	$(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$
2	T	T	T	T	F	T	T	T	T	T
4	T	T	T	F	F	T	T	F	F	F

- F) Now create a *different* compound statement, (YOUR EQUIVALENT STATEMENT), which is logically equivalent to the negation of your statement,  $\sim(\text{YOUR STATEMENT})$ . This statement cannot have the same form as  $\sim(\text{YOUR STATEMENT})$ , but it must have the same truth values for all cases, AND you will demonstrate the logical validity by creating a truth table with  $\sim(\text{YOUR STATEMENT})$  and next to it (YOUR EQUIVALENT STATEMENT)

Using De Morgan's Laws (from 3.2):  $\sim(A \wedge B) \equiv (\sim A \vee \sim B)$

And

By noting from 3.3 notes on negating a conditional statement  $\sim(p \rightarrow q) \equiv (p \wedge \sim q)$ :

By using De Morgan's Law to the AND statements we would get.

$$\sim((x \wedge y) \wedge (p \rightarrow q) \wedge \sim r) \equiv \sim(x \wedge y) \vee \sim(p \rightarrow q) \vee \sim(\sim r)$$

Now using DeMorgan's Law again,  $\sim(x \wedge y) \equiv (\sim x \vee \sim y)$

Using the equivalence,  $\sim(p \rightarrow q) \equiv (p \wedge \sim q)$

And using the double negative,  $\sim(\sim r) \equiv r$

We have

$$\sim(x \wedge y) \vee \sim(p \rightarrow q) \vee \sim(\sim r) \equiv (\sim x \vee \sim y) \vee (p \wedge \sim q) \vee r$$

Thus (YOUR EQUIVALENT STATEMENT) is

$$(\sim x \vee \sim y) \vee (p \wedge \sim q) \vee r$$

Which is equivalent to

$$\sim x \vee \sim y \vee r \vee (p \wedge \sim q)$$

Now I will demonstrate the logical equivalence of

$$\sim((x \wedge y) \wedge (p \rightarrow q) \wedge \sim r) \equiv \sim x \vee \sim y \vee r \vee (p \wedge \sim q)$$

by using a truth table: See next page

I notice that for my equivalent statement to be true, only one of the component statements:  $\sim x$ ,  $\sim y$ ,  $r$ ,  $(p \wedge \sim q)$  need be true.

Case	$x$	$y$	$p$	$q$	$\sim q$	$r$	$\sim x$	$\sim y$	$p \wedge \sim q$	$\sim((x \wedge y) \wedge (p \rightarrow q) \wedge \sim r)$	$(\sim x \vee \sim y) \vee (p \wedge \sim q) \vee r$
1	T	T	T	T	F	T	F	F	F	T	T
2	T	T	T	T	F	F	F	F	F	F	F
3	T	T	T	F	T	T	F	F	T	T	T
4	T	T	T	F	T	F	F	F	T	T	T
5	T	T	F	T	F	T	F	F	F	T	T
6	T	T	F	T	F	F	F	F	F	F	F
7	T	T	F	F	T	T	F	F	F	T	T
8	T	T	F	F	T	F	F	F	F	F	F
9	T	F	T	T	F	T	F	T	F	T	T
10	T	F	T	T	F	F	F	T	F	T	T
11	T	F	T	F	T	T	F	T	T	T	T
12	T	F	T	F	T	F	F	T	T	T	T
13	T	F	F	T	F	T	F	T	F	T	T
14	T	F	F	T	F	F	F	T	F	T	T
15	T	F	F	F	T	T	F	T	F	T	T
16	T	F	F	F	T	F	F	T	F	T	T
17	F	T	T	T	F	T	T	F	F	T	T
18	F	T	T	T	F	F	T	F	F	T	T
19	F	T	T	F	T	T	T	F	T	T	T
20	F	T	T	F	T	F	T	F	T	T	T
21	F	T	F	T	F	T	T	F	F	T	T
22	F	T	F	T	F	F	T	F	F	T	T
23	F	T	F	F	T	T	T	F	F	T	T
24	F	T	F	F	T	F	T	F	F	T	T
25	F	F	T	T	F	T	T	T	F	T	T
26	F	F	T	T	F	F	T	T	F	T	T
27	F	F	T	F	T	T	T	T	T	T	T
28	F	F	T	F	T	F	T	T	T	T	T
29	F	F	F	T	F	T	T	T	F	T	T
30	F	F	F	T	F	F	T	T	F	T	T
31	F	F	F	F	T	T	T	T	F	T	T
32	F	F	F	F	T	F	T	T	F	T	T

I have found what my equivalent statement is and shown that it is logically equivalent to the negation of my original statement.

G) Using logic gates create a circuit that replicates your statement. This can be an actual circuit with gates you purchase, a simulated circuit using virtual gates, or a very realistic drawing of your circuit using the proper shape of each type of gate. Then, for your truth values (as determined in D), clearly show how your circuit will produce the truth value you determined your statement to have in section D).

From Section 3.3 we showed that the negation of a conditional statement is as follows:

$$\sim(p \rightarrow q) \equiv (p \wedge \sim q)$$

A negation of these statements using the double negative and by use of De Morgan's Law:

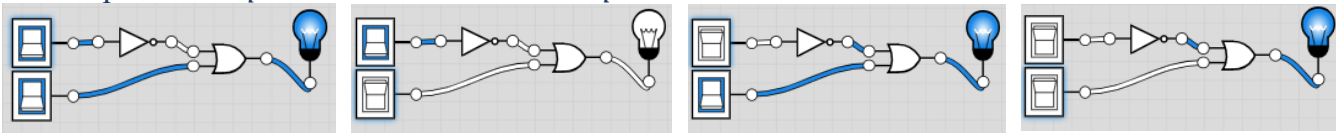
$$\sim[\sim(p \rightarrow q)] \equiv (p \rightarrow q) \text{ \& } \sim(p \wedge \sim q) \equiv \sim p \vee q$$

Reveals

$$(p \rightarrow q) \equiv \sim p \vee q$$

I can use this form to create a conditional statement using logic gates.  $(p \rightarrow q)$  then looks like this:

If the top switch is  $p$  and the bottom switch is  $q$



$p = T \text{ \& } q = T$

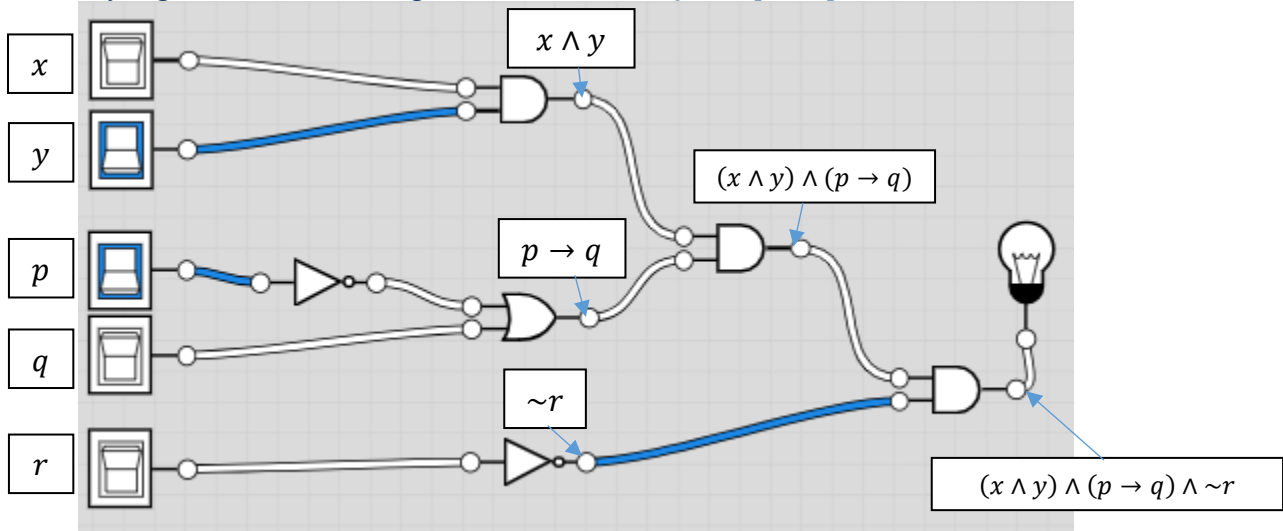
$p = T \text{ \& } q = F$

$p = F \text{ \& } q = T$

$p = F \text{ \& } q = F$

This shows my circuit has the same logical equivalence to  $(p \rightarrow q)$ .

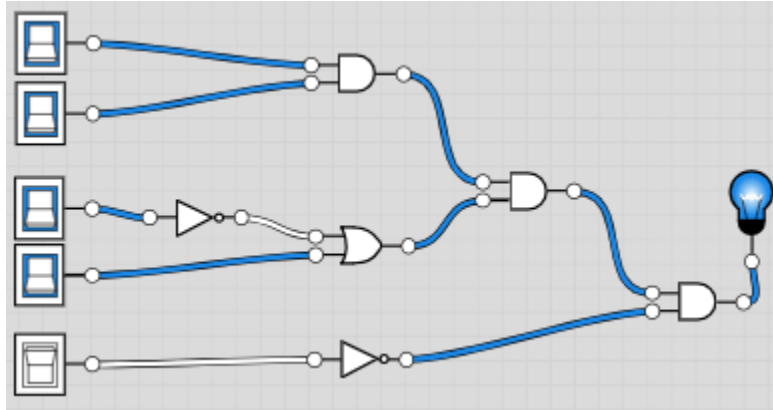
My logic circuit for the logical statement  $(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$  is shown below:



I will demonstrate how my circuit will emulate the logical output for my two cases:  
 Note: blue/on indicates T and white/off indicates F

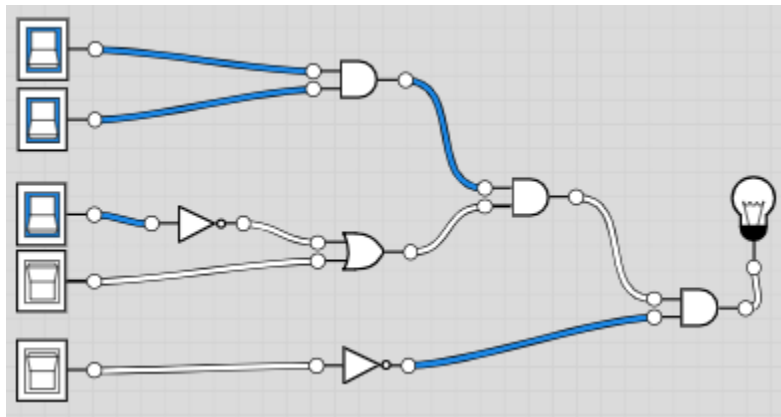
Case 2:

$x$	$y$	$p$	$q$	$r$	$(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$
T	T	T	T	F	T



Case 4:

$x$	$y$	$p$	$q$	$r$	$(x \wedge y) \wedge (p \rightarrow q) \wedge \sim r$
T	T	T	F	F	F





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*Part 2: Arguments*

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- A) Find a complex logical political, literary, film, philosophic, or other **argument**. This argument should include multiple sentences, and arrive at some sort of conclusion that you are able to test the validity or non-validity of the argument. Again, transcribe or write out the entire argument. If the argument is from a video, then include a transcription of the argument and include a link to the video.

This is from Alan Dershowitz's presentation to the US senate in the 2020 President Trump impeachment trial. This is a [link to a video](#) of his speech. The transcript begins at 3:14 minutes in. This is a transcript of his speech:

Chief Justice: The question is addressed to the counsel for the President. As a matter of law, does it matter if there was a quid pro quo? Is it true that quid pro quos are often used in foreign policy?

Alan Dershowitz: Chief Justice. Thank you very much for your question. Yesterday I had the privilege of attending the rolling out of a peace plan by the President of the United States regarding the Israel-Palestine conflict and I offered you a hypothetical the other day. What if the democratic president were to be elected and Congress were to authorize much money to either Israel or the Palestinians, and the democratic president were to say to Israel, 'No, I'm going to withhold the money Congress authorized to you unless you stop paying terrorist[s]. And the President said, 'quid pro quo, if you don't do it, you don't get the money, if you do it, you get the money.' There's no one in this chamber that would regard that as in any way unlawful. **The only thing that would make a quid pro quo unlawful is if the quo were in some way illegal.**

Now, we talk about motive. **There are three possible motives that a political figure can have. One, a motive in the public interest and the Israel argument would be in the public interest. The second is in their own political interest, and third, which hasn't been mentioned, would be, in his own financial interest; his own pure financial interest, putting money in the bank. I want to focus on the second one for just one moment. Every public official that I know believes that his election is in the public interest and, mostly your right, your election is in the public interest. And if a President does something which he believes will help him get elected in the public interest, that cannot be the kind of quid pro quo that results in impeachment.**

- B) Using variables and let statements, deconstruct your statement into its equivalent symbolic logical form. The argument is essentially a clever and complicated transitive argument or a hypothetical syllogism. It can be interpreted as follows:

A = There are only 3 possible motives for a politician

And

B = If there is a quid pro quo AND

(1. C = if the motive is in the public interest then D = this is legal and not impeachable)

OR (2. E = if the motive is in self political interest then F = this is not legal and impeachable)

OR (3. G = if the motive is in self financial interest then F = this is not legal and impeachable)

AND

If 2, (E) A politician acts in their own political interest in AND H = the form is their own reelection, then they are really acting in the public interest. (C)

AND

J = A President is a politician

Therefore

If a President's motives are to act in the interest of their reelection, then the President is also acting in the public interest.

AND

If any President commits a quid pro quo AND their motive is in their self-interest AND their self-interest is reelection, THEN this is really in the public interest AND it is legal AND not impeachable.

Symbolically:

A

$[(B \wedge C) \rightarrow D] \vee [(B \wedge E) \rightarrow F] \vee [(B \wedge G) \rightarrow F]$

$[(E \wedge H) \rightarrow C]$

J

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$\{A \wedge J \wedge B \wedge E \wedge H\} \rightarrow D$

This argument amounts to a network of possible logical conditional statements with multiple outcomes.

Mr. Dershowitz is only setting up his interpretation of the possible scenarios at play, and what they lead to as a consequence in terms of impeachment.

- C) Determine the type of argument(s) that is being made, or what your interpretation of the argument is by fitting it into a specific argument type. Determine if this is a valid logical form or if it is a logical fallacy.

Mr. Dershowitz uses a transitive argument, or hypothetical syllogism. He then hypothesizes that under a specific set of conditions,  $A \wedge J \wedge B \wedge E \wedge H$ , the logical outcome one must arrive at is D, through a set of transitive implications.

That

As long as there are only 3 motives a politician can have

AND

A president is a politician

AND

When any politician utilizes a quid pro quo

AND

Their motivation is in self political interest

AND

That interest is for their reelection

THEN the conclusion one must arrive at by his transitive argument is:

This motive is actually in the public interest

Which means

It is legal and not impeachable.

- D) Then briefly state whether you feel this argument is convincing and why. Do you think there are any unforeseen consequences that result from the argument? If so, what and why?

I believe this argument is very convincing and polarizing. A person can choose to reject his premises that there are only 3 motives, or that these are the only three. A person can attempt to reject one of the assertions; like a politician acting in the interest of reelection is actually acting in the public interest. But once Mr. Dershowitz statements have been accepted as true, you are forced into his conclusion.

Some unforeseen consequences are, any future President and impeachable politician to can use this argument as justification for making these specific actions legal; he is creating a precedent for the acceptance for this behavior. This also leaves the door open to a slippery slope of other interpretations, like accepting bribe money for your political campaign, or asking someone to commit voter fraud as a quid pro quo, could now be interpreted as being in the public interest and thus legal!

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*Part 3: For Teaching*

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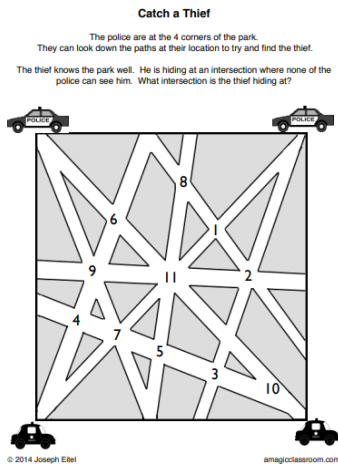
- A) Create a lesson plan for solving logic problems for students in your desired grade level.  
See the [file I have created](#) on Chapter 3 extension: a lesson plan on logic problems  
[https://marcolsen.weebly.com/uploads/1/3/6/4/13641528/310\\_chapter\\_3\\_extension\\_logic\\_problems\\_and\\_sudoku.pdf](https://marcolsen.weebly.com/uploads/1/3/6/4/13641528/310_chapter_3_extension_logic_problems_and_sudoku.pdf)
- B) Create a ready to use handout with a logic puzzle to be solved. Formatting, directions, puzzle statement and room to solve should all be accounted for. The puzzle does not have to be of your own creation, you can borrow the content from other sources. Make sure the puzzle is ready for use by a teacher, that they can simply take this document and know how to implement it, then have a handout for the students to work on. It needs to be “Plug and Play” easy for any teacher to just pick up and use. If you do take your puzzle from a source, include a link or make sure to give a works cited for it so that it can be looked up if desired.

This puzzle was taken from:

[http://amagicclassroom.com/uploads/3/4/5/2/34528828/catch\\_a\\_thief.pdf](http://amagicclassroom.com/uploads/3/4/5/2/34528828/catch_a_thief.pdf)

Have your students use a highlighter to rule out all possible locations that a person can hide without being seen, by highlighting all the places that the person can be seen.

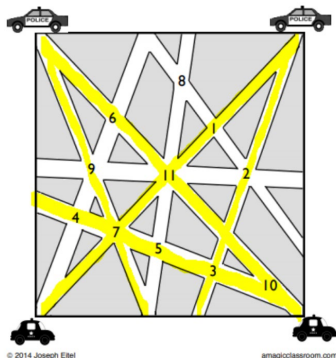
Or do not provide any instructions, and let your students determine the location, then ask them how they know that must be the “safe hiding place” by showing their classmates their reasoning.



- C) Make a separate document where you have worked out the solutions (a key) to your handout if it was not included in your handout already.

**KEY:**

The solution is the person must stand at intersection 8.



Grading: This will be a 100 point project. You will be graded on:

- **5 points. Following directions**
- **10 points: Well explained and documented.** Your work should be very clear and should walk the reader through your final thoughts in detail. Be careful not to assume the reader already knows what you know.
- **10 points: Formatting is spacious and considerate of aesthetics as well as readability.** The entire project should be presented in one single word or pdf document, utilizing in page breaks to separate out topics, parts, and handouts. You will submit your document on Canvas as a word or pdf file only.
  - Include a separate SINGLE file for your entire Chapter 3 Project
  - For Part 3:
    - Attach a second file that includes your completed lesson plan.
    - Attach a third file that includes your completed handout and key.
- **60 pts. Effort:** I will be grading heavily on my perception of your effort for this project. This class has very little obligations and assignments (only attending class and doing some homework for which you have answers to in the back of your book), so these projects are expected to utilize the lion's share of your total time requirements for this course for the entire semester. I will grade with a high standard. I am looking for statements and arguments that are clever, politically or personally or humorously relevant and meaningful to you. I do not want some simple "see dick run" style of simple statements and arguments or other sources where the deconstruction of the statement is unchallenging or obvious. I want this assignment to expand your knowledge, require thought and care, and force you to expand what you understand about this material. I expect that you will extend the ideas in the book into the everyday world around you, and make the reader of your project feel interest in what you are discussing. Your goal is to spark their interest and hold their attention. You must honor the spirit of the assignment to meet my expectations. Anything short of these expectations will result in a loss of points.
- **15 pts. Correctness.** Your work should be completely and totally logically correct.

Hints:

As a source, you could look at headline worthy statements in the news, favorite or other quotes, sports training books or other instructional materials (Ikea instructions?). Get creative, and have fun. But this assignment is heavily dependent on finding the perfect statement and argument! So find good ones!

HAVE FUN! I sure enjoyed everything I learned by making my example!