

Wff 'N Proof #1

Name

Hour

Note: "Wff 'N Proof" is knowing what a "Wff" is, knowing "in" and "out" rules, and putting them in a "proof". "Wff 'N Proof" is called a symbolic (symbols) logic game. You have to learn rules and write them logically.

Wffs: Here are what wffs look like:

- 1) p, q, r, s : These are 1 letter wffs. They are lower case.
- 2) We put C,A,K,E letters in front to make 3 letter wffs, 5 letter wffs, 7 letter wffs, 9 letter wffs, etc.
 - A) 3 letter wffs: Krs, Cpq, Apr, Eqq, Krr, Esr, Kss, Csr, Epq, Arr. Krs is called a "K" wff. Cpq is called a "C" wff. Apr is called an "A" wff. Eqq is called an "E" wff. Krr is called a "K" wff and so forth.
 - B) 5 letter wffs: CrKsp, KqEsq, ApKsr, KrKrr, KEspr, ACrrp, KAspr, ECrps. CrKsp is called a "C" wff. KqEsq is called a "K" wff. ACrrp is called an "A" wff, and so forth.
 - C) 7 letter wffs: ACspErq, KKsqApr, CEpqEqp, EKrqCsr, AAspArs, ACEsprq, KKAsqpr. ACspErq is called an "A" wff. KKsqApr is called a "K" wff and so forth.

3) After each CAKE letter you have to have 2 wffs (we call them w1(wff 1) and w2(wff 2)): They can be either 1 letter wffs, or 3 letter wffs, 5 letter wffs, or 7 letter wffs, or a combination of these. **Cw1w2** (pronounced C wff 1 wff 2) means that there is wff 1 and wff 2 after the C. **Kw1w2** (pronounced K wff 1 wff 2) means there is w1 and w2 after the K.

A) Crp: r is w1 and p is w2. Ksr: s is w1 and r is w2. ArEps: r is w1 and Eps is w2. KEspCqr: Esp is w1 and Cqr is w2.

B) CrKsp: r is w1 and Ksp is w2. ACrrp: Crr is w1 and p is w2. KApqs: Apq is w1 and s is w2. KKspArq: Ksp is w1 and Arq is w2. Ars: r is w1 and s is w2. EpKrq: p is w1 and Krq is w2.

B) Can you identify w1 and w2? 1) Csr 2) ArKsp 3) EAsqr 4)Kqq 5)CArsApq 6) KqAsr 7) Esp 8) KAsqp

4) **NOT WFFS** : Kr, sp, sE, Es, rsp, Krpq, Arqspq, A, rAs. Why? Kr is just Kw1 without w2. sp is w1w2 but no CAKE letter. sE is backwards and no w2. rsp has no CAKE letters. Krpq needs another CAKE letter. Arqspq needs 2 more CAKE letters. A needs 2 lower case wffs. rAs is in the wrong order.

Note: "Wff 'N Proof" has "Wffs" and "Rules" that you write in "Proofs".

Note: Each "Wff 'N Proof" game has 14 capital letters (C,A,K,E,R,N) and 14 lower case letters (p,q,r,s,i,o).

- A) p,q,r,s are 1 letter wffs that can make 3, 5, 7, or 9 letter wffs.
- B) i means the rule "in": You put a wff "in" another wff.
- C) o means the rule "out": You take "out" a wff from another wff.
- D) Ko, Ki, Rp(Repetition), Ai, Co, Eo, and Ei are seven(7) rules for Basic Wff 'N Proof.
- E) Ao, Ci, No, R(Reiteration), and Ni are added on to the other 7 rules for Regular Wff 'N Proof.
- F) N and R: N means NOT and is attached to the wff it is in front of(Nr, NKsp, ArNq). R is Reiteration.

How to write Rules in Proofs.

Ko: K out(Took w1 from K wff)

	Premise	Goal
	$Krs \longrightarrow r$	
1	Krs	s (suppose)
2	r	1,Ko

Solution: Premise/Rules

Krs/Ko

Ko: K out(Took w2 from K wff)

	Premise	Goal
	$Kpq \longrightarrow q$	
1	Kpq	s (suppose)
2	q	1,Ko

Solution: Premise/Rules

Kpq/Ko

Ko: K out(Ko twice to get p)

	Premise	Goal
	$KsKrp \longrightarrow p$	
1	KsKrp	s (suppose)
2	Krp	1,Ko
3	p	2,Ko

Solution: Premise/Rules

KsKrp/Ko

Ki: K in(Put two 1 letter wffs "in" a K wff)

	Premises	Goal
	$r,s \longrightarrow Krs$	
1	r	s (suppose)
2	s	s (suppose)
3	Krs	1,2 Ki

Solution:

r,s/Ki

Ki: K in(Put two wffs "in" a K wff)

	Premises	Goal
	$Arp,q \longrightarrow KqArp$	
1	Arp	s (suppose)
2	q	s (suppose)
3	KqArp	1, 2, Ki

Solution:

Arp,q/Ki

Name _____

Hour _____

Rp: Repetition or Repeat (Write a wff again)

	$r \longrightarrow r$	
1	r	s
2	r	1,Rp

Solution:

r/Rp

Rp: Repetition or Repeat(Write a wff again and used with another rule)

	$p \longrightarrow Kpp$	
1	p	s
2	p	1,Rp
3	Kpp	1,2 Ki

Solution:

p/Rp,Ki

Ai: A in (Get one wff and the other is free.)

Buy one, get one free)(The p is free)

	$r \longrightarrow Arp$	
1	r	s
2	Arp	1,Ai

Solution: r/Ai

Ai: A in(Buy one, get one free)

	$p \longrightarrow AKsqp$	
1	p	s
2	AKsqp	1,Ai

Solution: p/Ai

Ai: A in (Buy one, get one free)

(The Esp is free)

	$q \longrightarrow AqEsp$	
1	q	s
2	AqEsp	1,Ai

Solution: q/Ai

Ai: A in(Buy one, get one free)

	$s \longrightarrow ACqqs$	
1	s	s
2	ACqqs	1,Ai

Solution: s/Ai

Name _____

Hour _____

Co: C out(You get w2 if you have a match for w1)

	Crp, r	→	p
1	Crp		s
2	r		s
3	p		1,2 Co

Note: The two "r's" match up.

Solution: Crp,r/Co

Co: C out(You get w2 if you can match w1 in the C wff)

	Cqr,q	→	r
1	Cqr		s
2	q		s
3	r		1,2 Co

Note: The two "q's" match up.

Solution: Cqr,q/Co

Co: C out(with Ko)

	Csq,Ksp	→	q
1	Csq		s
2	Ksp		s
3	s		2,Ko
4	q		1,3 Co

Note: The "s" in the C wff matches step 3 "s".

Solution: Csq,Ksp/Ko,Co

Co: C out(with Ai)

	CArps,r	→	s
1	CArps		s
2	r		s
3	Arp		2,Ai
4	s		1,3 Co

Note: The Arp in the C wff matches Arp on step 3.

Solution: CArps,r/Ai,Co

Eo: E out(You get a C wff out of the E wff:Cw1w2 or Cw2w1)

	Esp	→	Csp
1	Esp		s
2	Csp		1,Eo

Note: Eo gets you Cw1w2 or Cw2w1 from the E wff.

Solution: Esp/Eo

Eo: E out(You get Cw1w2 or Cw2w1 out of the E wff)

	Erq	→	Cqr
1	Erq		s
2	Cqr		1,Eo

Note: You could have gotten Crq from Erq.

Solution: Erq/Cqr

Name

Hour

Eo: E out(You get a C wff with either Cw1w2 or Cw2w1)

	ErAsp	→	CAspr
1	ErAsp		s
2	CAspr		1, Eo

Note: This goal was Cw2w1 taken from Ew1w2.

Solution: ErAsp/Eo

Ei: E in(You need two C wffs with w1w2 switched around)

	Csp, Cps	→	Esp
1	Csp		s
2	Cps		s
3	Esp		1,2 Ei

Note: Notice that the two C wffs are on separate lines.

Solution: Csp,Cps/Ei

Ei: E in(You need two C wffs with w1w2 switched around)

	KCsrp, Crs	→	Esr
1	KCsrp		s
2	Crs		s
3	Csr		1,Ko
4	Esr		2,3 Ei

Note: You had to Ko the Csr before Ei

Solution: KCsrp,Crs/Ko,Ei

Ei: E in(You need two C wffs, Cw1w2 and Cw2w1, to make either the E wff Ew1w2 or Ew2w1)

	Cqr, Crq	→	Erq
1	Cqr		s
2	Crq		s
3	Erq		1,2 Ei

Note: You could have gotten Erq from these 2 C wffs.

Solution: Cqr, Crq/Ei

Ei: E in(Cw1w2 and Cw2w1 gets you Ew1w2 or Ew2w1. Ko is used, also)

	KCsqCqs	→	Eqs
1	KCsqCqs		s
2	Csq		1,Ko
3	Cqs		1, Ko
4	Eqs		2,3 Ei

Note: You have to Ko the two C wffs, first before Ei.

Solution: KCsqCqs/Ko,Ei

Ei: E in(Get the two C wffs on separate lines)

	Erp	→	Epr
1	Erp		s
2	Crp		1,Eo
3	Cpr		1,Eo
4	Epr		2,3 Ei

Note: You had to Eo each C wff separately. Then Ei.

Solution: Erp/Eo,Ei