64
64
63
63
60
58

A

57
57
55
54
53

B

85 %

51
51
51
50
45

C

44
40

D

36
31

F

① $p \rightarrow (q \wedge r)$

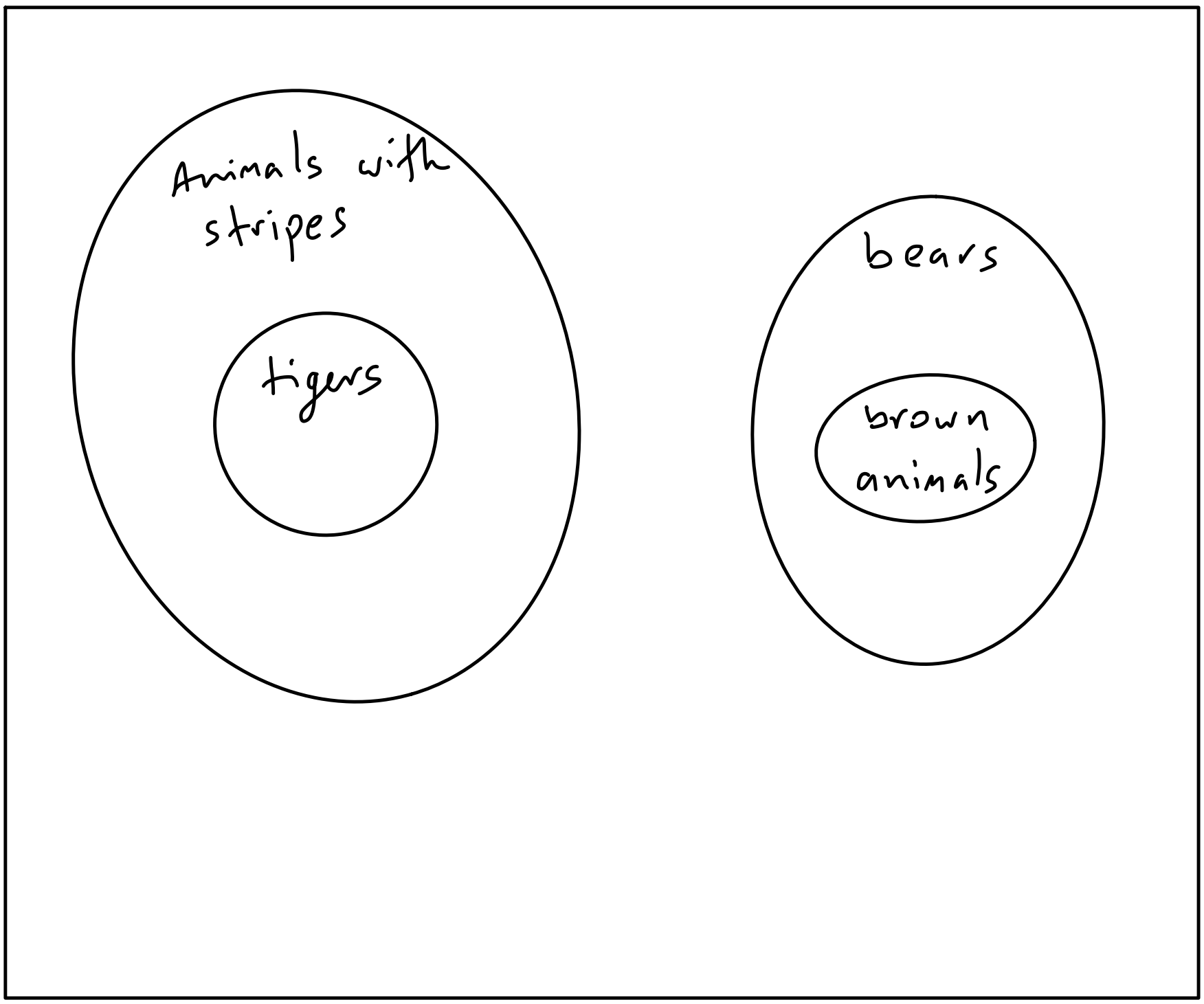
p	q	r	$q \wedge r$	$p \rightarrow (q \wedge r)$
T	T	T	T	T
T	T	F	F	F
T	F	T	F	F
T	F	F	F	F
F	T	T	T	T
F	T	F	F	T
F	F	T	F	T
F	F	F	F	T

(2) 1. All tigers have stripes.

2. Nothing with stripes is a bear.

3. All brown animals are bears.

No tigers are brown.



Therefore, the argument is valid.

(3) p: All tigers have stripes

q: Nothing with stripes is a bear

r: All brown animals are bears

s: No tigers are brown

$(p \wedge q \wedge r) \rightarrow s$

OR

P: you are a tiger

q: you have stripes

r: you are a bear

s: you are a brown animal

1. $p \rightarrow q$
2. $q \rightarrow \sim r$

3 $s \rightarrow r$

$p \rightarrow \sim s$ (or $s \rightarrow \sim p$)

(4) 1. You eat only if you are hungry

2. If you go to a restaurant, then you eat

You are hungry if you go to a restaurant.

This is valid.

Let p be "you eat"

q be "you are hungry"

r be "you go to a restaurant".

Then $P_1 \equiv p \rightarrow q$

$P_2 \equiv r \rightarrow p$

$C \equiv r \rightarrow q$

P	q	r	P_1	P_2	C	$P_1 \wedge P_2$	$P_1 \wedge P_2 \rightarrow C$
T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	T
T	F	T	F	T	F	F	T
T	F	F	F	T	T	F	T
F	T	T	T	F	T	F	T
F	T	F	T	T	T	T	T
F	F	T	T	F	F	F	T
F	F	F	T	T	T	T	T

✓

(5) You are hungry if you go to the restaurant.

$\equiv$ If you go to the restaurant, then you are hungry.

Converse: If you are hungry, then you go to the restaurant.

Inverse: If you don't go to the restaurant, then you are not hungry.

Contrapositive: If you are not hungry, then you do not go to the restaurant.

For any statement, the contrapositive is equivalent to it.

(6) A: UO students who are currently taking 105.

B: UO students who have taken and passed 105.

$A \cup B$: UO students who have either taken 105 or are currently in 105.

$A \cap B$: UO students who are currently taking 105 but who have also taken and passed it before.

A': UO students who are not currently in 105.

B': UO students who have not passed 105.

(7) Which is/are true:

i. $A \cup B = \emptyset$

ii. $A \cap B = \emptyset$

iii. $A' = \emptyset$

iv. $B' = \emptyset$

(8) C has 15 elements

D has 10

$C \cup D$ has 17

$n(C \cap D)$?

$$n(C \cup D) = n(C) + n(D) - n(C \cap D)$$

$$17 = 15 + 10 - n(C \cap D)$$

$$n(C \cap D) = 8.$$