P: you have the flu
q: you miss the final exame

a) $\neg p$: you don't have the flu

b) $p \wedge q$ you have the flu and you miss the final

you miss the final exam because you have the flu

$\neg p \wedge p \equiv p \wedge \neg p$

p	$\neg p$	$\neg p \wedge p$
T	F	F
F	T	F

$p \longrightarrow \neg q$

p	q	$\neg q$	$p \longrightarrow \neg q$
T	T	F	F
T	F	T	T
F	T	F	T
F	F	T	T

$$p \longleftrightarrow q \equiv (p \wedge q) \vee (\neg p \wedge \neg q)$$

p	q	¬p	¬q	p∧q	¬p∧¬q	(p∧q)∨(¬p∧¬q)	p↔q
T	T	F	F	T	f	T	T
T	f	F	T	F	f	f	f
f	f	f	f	f	f	f	f
f	T	T	f	f	f	T	T
f	f	T	T	f	T	T	T

$$P \longleftrightarrow q \equiv (p \wedge q) \vee (\neg p \wedge \neg q)$$

$N(x):$ x has visited North Dakota

↑ student

a) $\exists x \, N(x)$: there exists a student in your class has visited North Dakota

$\exists x \, \neg N(x)$: there exists a student in your class has not visited N.D.

$\neg \exists x \, N(x)$: No student in class has visited N.D.

$C(x):$ x has a cat   x: student
$D(x):$ x has a dog

A student has a cat and a dog.

$$\exists x \, (C(x) \wedge D(x))$$

$\forall x \, \forall y \, \exists z \, (x = y - z)$ D: $\mathbb{R}$

for every x real number, and for every
real numbers y, there exists a real
number z such that $x = y - z$

Show square of even number is even number
$$n \text{ is even} \implies n^2 \text{ is even}$$

n is even $\implies$

$$n = 2k$$
$$n^2 = (2k)^2$$
$$= 4k^2$$
$$= 2(2k)$$

$\therefore$ n is even $\implies$ n^2 is also even

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venn diagram
A, B --- set
$a_1, a_2, --$ or $b_1, b_2 --$ are elements.
$A \cap B$, $A \cup B$, $A - B$, $A \times B$ ✎
$A \cup \bar{A} = \mathcal{U}$ $A \cap \bar{A} = \phi$

$A \subseteq B$: let $x \in A$, then $x \in B$.

$$A = \{1, 2, 3, 4, 5\}$$
$$B = \{6, 7, 8, 9\}$$

$$A \cap B = \phi$$
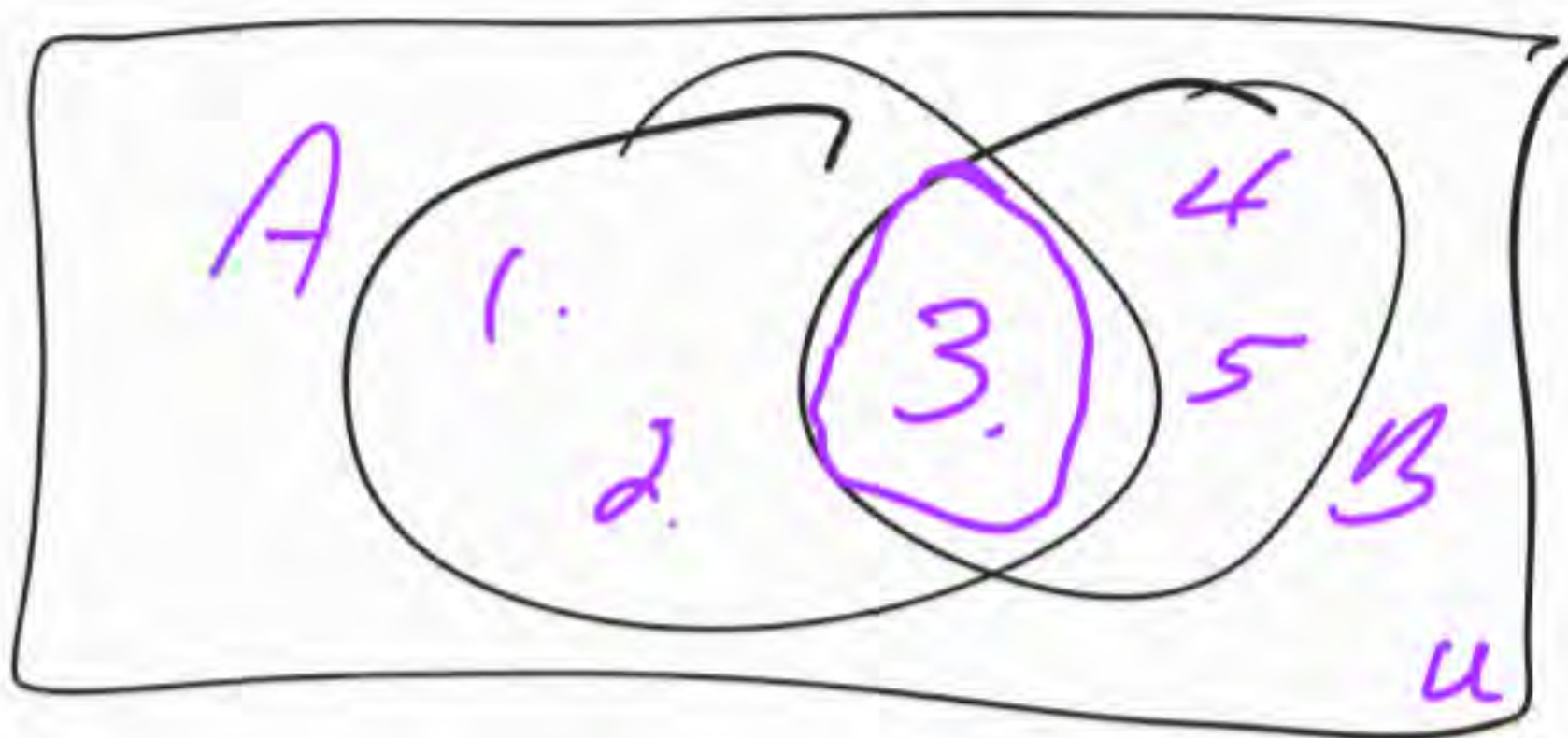$$A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$A = \{1, 2, 3\}$$
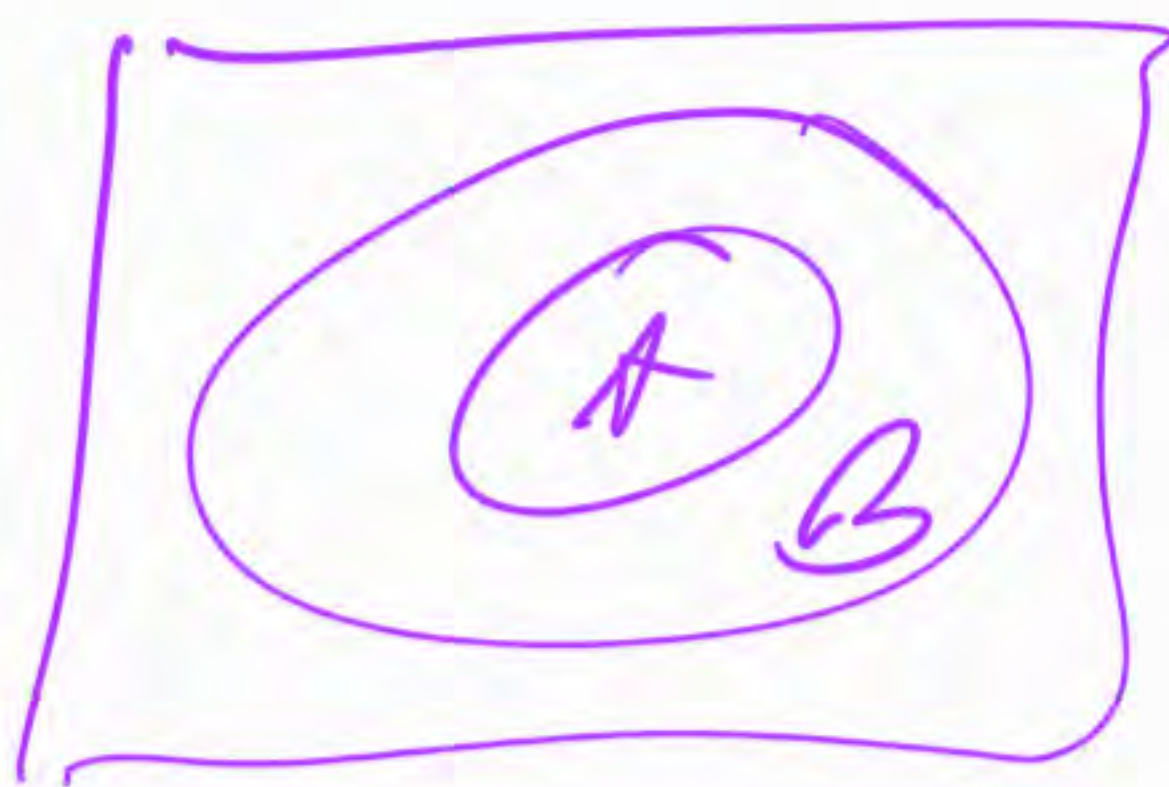$$B = \{3, 4, 5\}$$
$$A - B = \{1, 2\}$$
$$B - A = \{4, 5\}$$

$$A \times B = \{(1,3), (1,4), (1,5), (2,3), (2,4),$$
$$(2,5), (3,3), (3,4), (3,5)\}$$

$$C \cap (B - A)$$

$C \cap \bar{A}$

$A \subseteq B$

you are <u>not</u> allowed to leave
Teams

Done → type conversation
       Done, # pages.
       < 1 minute
       take pictures (low resolution)
              email (?)? pages

<u>Waits</u> ←

Thank u. →