Mengder

Mengder med samme elementer er like:

Elementer er ikke ordnet:
{1,2,3} = {3,1,2}

Antall forekomster telles ikke:
{1,1,2,3,3,3} = {1,2,3}

Element og delmengde

$$3 \in \{1,3,5\}$$
$$\{\ 3\ \} \subset \{1,3,5\}$$
$$\{1,3\} \subset \{1,3,5\}$$
$$\{1,3,5\} \subset \{1,3,5\}$$

OBS: $\subset$ brukes mange (de fleste…) andre steder for å angi såkalt *ekte delmengde*. For delmengde skriver man da $\subseteq$.

Mengder kan inneholde mengder

$\{1,2,3\}$

$\in \{\varnothing,\{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\},\{1,2,3\}\}$

Vi kan også ha blandete mengder:

$\{1,2\} \in \{1,2,\varnothing,\{1\},\{2\},\{1,2\}\}$

$\{1,2\} \subset \{1,2,\varnothing,\{1\},\{2\},\{1,2\}\}$

Mengdeoperasjoner og "regneregler"

Snitt $\cap$

Union $\cup$

Komplement '

$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$

$(A \cup B) \cup C = A \cup (B \cup C)$
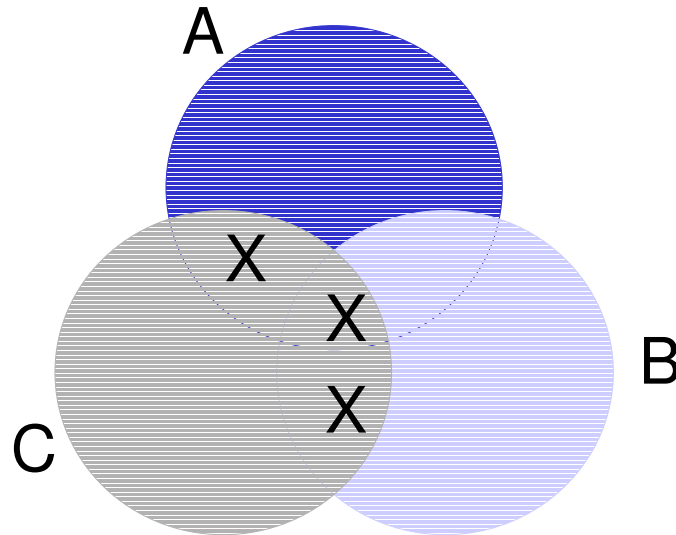
$(A \cap B) \cap C = (A \cap (B \cap C)$

$(A \cup B)' = (A' \cap B')$

etc.

Venn-diagram

$$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$$

Regneregler vs. ekvivalenser

$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$

$$((A \lor B) \land C) \equiv ((A \land C) \lor (B \land C))$$

$(A \cup B) \cup C = A \cup (B \cup C)$

$$((A \lor B) \lor C) \equiv (A \lor (B \lor C))$$

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

$$((A \land B) \land C) \equiv ((A \land (B \land C))$$

$(A \cup B)' = (A' \cap B')$

$$\neg(A \lor B) \equiv (\neg A \land \neg B)$$

"Mengdebygger"

{x | x er sånn&sånn} = mengden av ting som er sånn&sånn

Eksempler

$\{x \mid x \subset \{1,2\}\} = \{\varnothing, \{1\}, \{2\}, \{1,2\}\}$

$\{x \mid x = 1 \lor x = 2\} = \{1,2\}$

$\{x \mid x \in A \lor x \in B\} = A \cup B$

Utvidet "Mengdebygger"

{ x + 1 | x ∈ {1,3,6,8}} = {2,4,7,9}

{ x + y | x ∈ {1,3,6,8} & y ∈ {1,2}} = {2,3,4,5,7,8,9,10}

{ x + y | x ∈ {1,3,6,8} & y ∈ {1,4}} = {2,5,4,7,7,10,9,12}

$$= \{2,4,5,7,7,9,10,12\}$$
$$= \{2,4,5,7,9,10,12\}$$