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Subsets: $\{1, 3\} \subseteq \{1, 2, 3, 4\}$. Also, $\{1, 3\} \subset \{1, 2, 3, 4\}$

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Example: S_1 is the set of all students at Mason,

S_2 is the set of all classes offered at Mason.

Elements in the relation R indicate which students are enrolled in which classes.

$$S_1 = \{s_1, s_2, s_3\} \text{ and } S_2 = \{cs110, cs330\}$$

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Could have a relation from a set onto itself: $R \subseteq S \times S$

$S = \{\text{George VI, Elizabeth II, Prince Charles}\}$ and

P the relation that relates a child to the parent.

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$R : S_1 \rightarrow S_2$. S_1 is called the domain of R and S_2 the codomain

Example: $R : \mathcal{N} \rightarrow \mathcal{N}$, where $R(x) = x^2$

More on Functions

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$$\text{Taking } \mathcal{U} = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$S = \{0, 2, 4, 6, 8\}, \bar{S} = \{1, 3, 5, 7, 9\}.$$

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Let R denote the set of simple mathematical expressions.

- ▶ If ρ is a variable, then $\rho \in R$.
- ▶ If $\rho_1, \rho_2 \in R$ then $(\rho_1 + \rho_2) \in R$ and $(\rho_1 * \rho_2) \in R$.
- ▶ The first two rules define every element of R .