#17

gives a model of continuous growth at 3%

$$A = A_0 e^{0.03t}$$

$$A = A_0 (1.03)^t$$ annual growth.

$$1000 + \frac{1000}{e^{0.04}} + \frac{1000}{(e^{0.04})^2} + \frac{1000}{(e^{0.04})^3} + \cdots$$

$$= 1000 \sum_{n=1}^{\infty} (e^{-0.04})^{n-1} = 1000 \left(\frac{1}{1 - e^{-0.04}} \right)$$

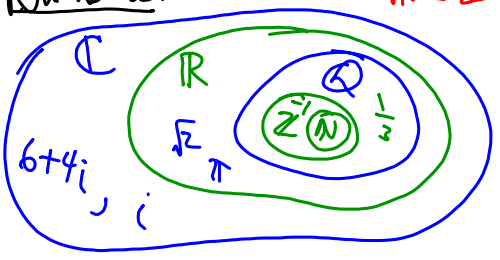
$$= 25,503.33$$

Discount a stream of payments P_i at a $K\%$ Continuous discount.

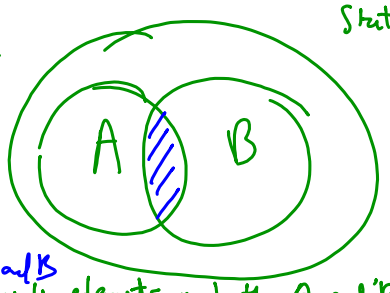
$$P_0 + \frac{P_1}{e^{0.0K}} + \frac{P_2}{(e^{0.0K})^2} + \cdots \frac{P_n}{(e^{0.0K})^n}$$

Sets and Venn Diagrams

Ex Numbers. $\mathbb{N} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R} \subset \mathbb{C}$



Ex States of America



A = states that begin w/ a vowel

B = states that end w/ a vowel.

intersection of A and B → only elements in both A and B.

$A \cap B = \{$ Alaska, Iowa, Ohio, ... etc $\}$

union of A or B

$A \cup B = \{$ Arkansas, California, ... Alabama etc $\}$

↓ every element in A or B

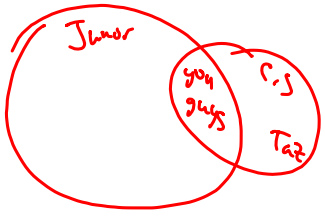
complement.

$\overline{A}$ or A^c = "not in A" $= \{$ California, NJ $\}$

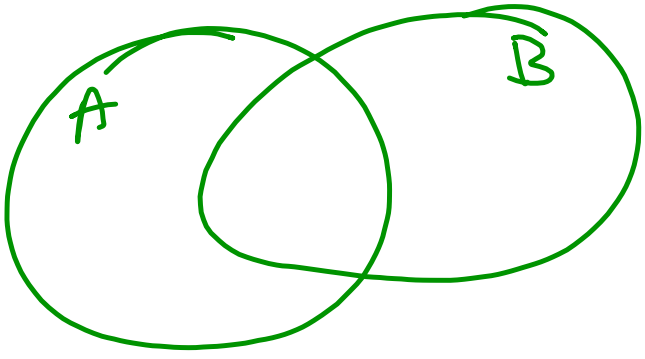
$\overline{B} = \{$ NY, Illinois ... etc Oregon $\}$

subset or containing $\subset$

$D = \{$ states that begin and end w/ A $\}$ $D \subset A \cap B$



Inclusion / Exclusion



$|A|$ = # of elements in A.

$$|A \cup B| = |A| + |B| - |A \cap B|$$

Ex

540 Students

335 ~~take~~ math = A

287 take scuba = B

220 take both

$\overline{A} = A \cap \overline{B}$

$B \cap \overline{A}$