

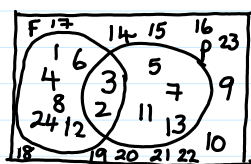
From last week

Q3: Write down the set  $F$  of factorsof 24  $F = \{1, 2, 3, 4, 6, 8, 12, 24\}$ Q4: Write down the set  $P$  of prime numbers lessthan 14  $P = \{2, 3, 5, 7, 11, 13\}$ Intersection

$$F \cap P =$$

overlap

$$\{x \mid x \in F \text{ and } x \in P\}$$



$$\text{so } F \cap P = \{2, 3\}$$

 $x$  is in both  $F$  and  $P$ 

Note. This was the prime factors of 24

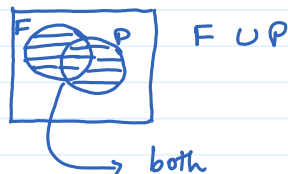
$$\text{U or } E = \{x \in \mathbb{Z}^+ \mid x \leq 24\}$$

Union

$$F \cup P = \{1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 24\}$$

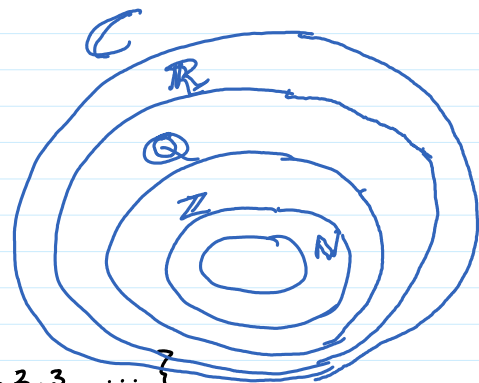
Either in  $F$  or in  $P$  or in both

$$F \cup P = \{x \mid x \in A \vee x \in B\}$$

Every nonempty set  $S$  has at least two subsets the empty set and the set  $S$  itself

$$\text{so } \emptyset \subseteq S \text{ or } \{ \} \text{ and } S \subseteq S$$

the empty set has no elements

NOT  $\{\emptyset\}$  — different meaning This is a set with a single member — the empty setProper Subset  $\subset$ This excludes the set itself, that is subsets of  $P$ are  $\{2, 3, 5\}$ ,  $\{2\}$ ,  $\{2, 3, 5, 7, 11\}$ ,  $\emptyset$ , etcbut not  $\{2, 3, 5, 7, 11, 13\}$  i.e.  $P$  itselfThink of  $\leq$  and  $<$ Q1 if  $A = \{\emptyset, \{a\}, \{b\}, \{a, b\}\}$  is  $a \in A$ ?Q2 if  $B = \{x \mid x \text{ is a subset of the set } \{a, b\}\}$  is  $A = B$ ? $\mathbb{N}$  is the set of natural numbers  $\{0, 1, 2, 3, \dots\}$  $\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$  the set of integers $\mathbb{Z}^+ = \{1, 2, 3, \dots\}$  set of positive integers $\mathbb{Q} = \{p/q \mid p \in \mathbb{Z}, q \in \mathbb{Z} \text{ and } q \neq 0\}$  the set of rational numbers $\mathbb{R}$  the set of real numbers, includes  $\pi, e, \sqrt{2}$  and  $\frac{1}{2}, -\frac{1}{4}, 3 = \frac{3}{1}, \frac{1}{q}$  $\mathbb{C}$  the set of complex numbersirrational numbers  
transcendentals