

Permutation - # of possible combinations  
 → order matters - picky

$${}_nPr = \frac{n!}{(n-r)!}$$

! factorial  
 $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

ex 4 members are running for  
 3 different NHS offices,  
 President, secretary, vice president.

$$\frac{100!}{(100-2)!} = \frac{100!}{98!}$$

$$\frac{100 \cdot 99 \cdot \cancel{98} \cdot \cancel{97} \cdot \cancel{96} \cdots 1}{\cancel{98} \cdot \cancel{97} \cdot \cancel{96} \cdots 1}$$

$$\frac{100 \cdot 99}{1} = 9900$$

${}_nP_r$   
 ${}_4P_3$   
 # possible { # picking

Calculator notes for  
 Probability

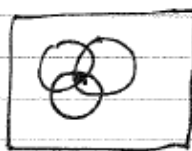
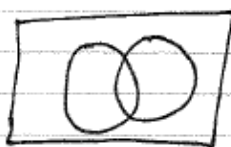
Enter # Possible  
 then  $\boxed{\text{math}}$  → to Prb  
 #2  $\boxed{\text{ENTER}}$   
 then # you are picking  
 $\boxed{\text{ENTER}}$

So 4  $\boxed{\text{math}}$  → #2  $\boxed{\text{ENTER}}$  3  $\boxed{\text{ENTER}}$  → 24

Homework

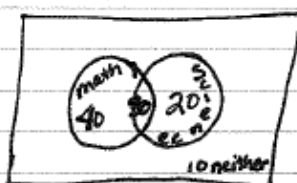
|           |            |
|-----------|------------|
| ${}_6P_5$ | 6, 11      |
| ${}_6P_8$ | 2, a, b, e |
|           | 3 a+b      |
|           | 4          |
|           | 5 a        |
|           | 9 a+b      |

## 12.3 Venn Diagrams



100 total students

- ✓ 70 math
- ✓ 50 science
- ✓ 30 both
- 10 neither



$$\frac{70}{100} = 70\% \text{ math class}$$

$$\frac{30}{100} = 30\% \text{ Both math + science}$$

$$\frac{20}{100} = 20\% \text{ only science}$$

← not math

10% neither