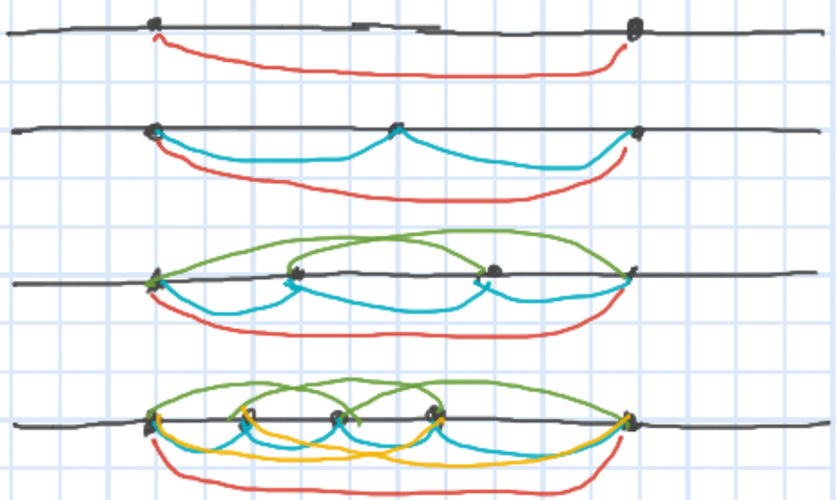
HW #13,

1.



2. points 1 segment

3 points 1 + 2 = 3 segment

4 points 1 + 2 + 3 segm.

5 points 1 + 2 + 3 + 4 seg.

10 points 1 + 2 + 3 + ... + 9.

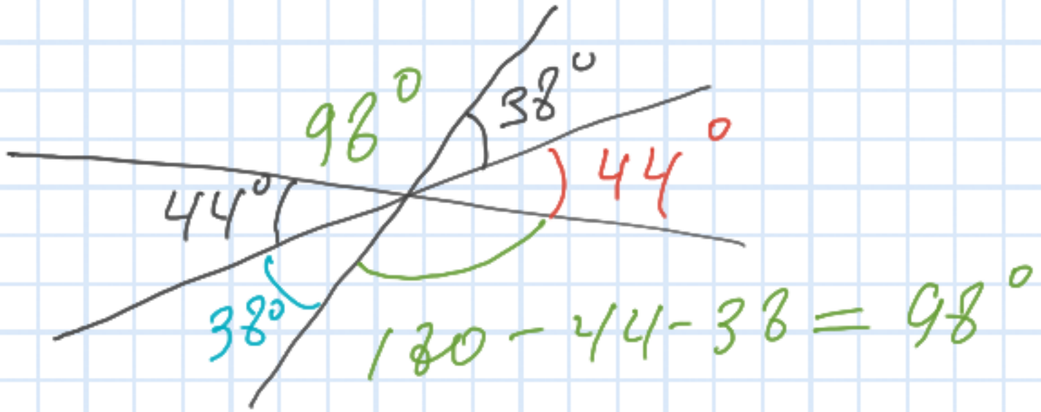
100 points 1 + 2 + 3 + ... + 99

$$\frac{100 \cdot 99}{2}$$

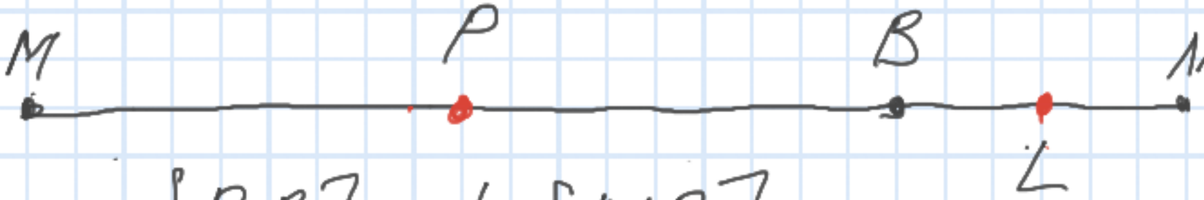
n points $$\frac{n \cdot (n-1)}{2}$$

or we can look at it as choosing 2 points out of n.

#2.



#3.



$|MN| = 12$ cm.

$[PB] = \frac{1}{2}[MB]$

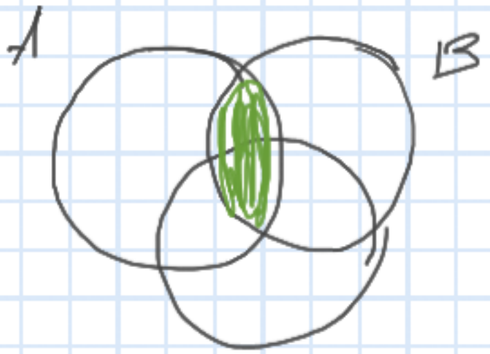
$[BL] = \frac{1}{2}[BN]$

$\frac{1}{2}[MB] + \frac{1}{2}[BN] = \frac{1}{2}([MB] + [BN]) = \frac{1}{2} \cdot 12 = 6.$

This length doesn't depend of the position of the point B.

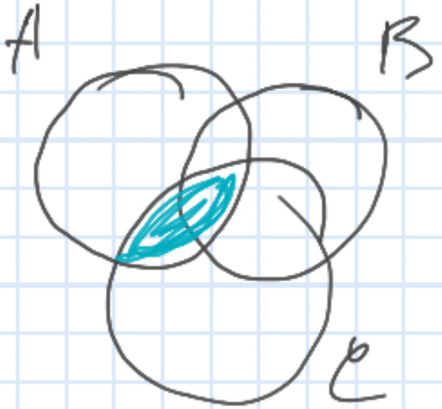
#4

a.



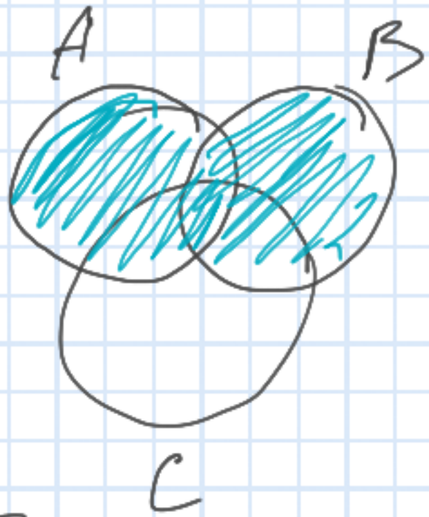
$A \cap B$

b.



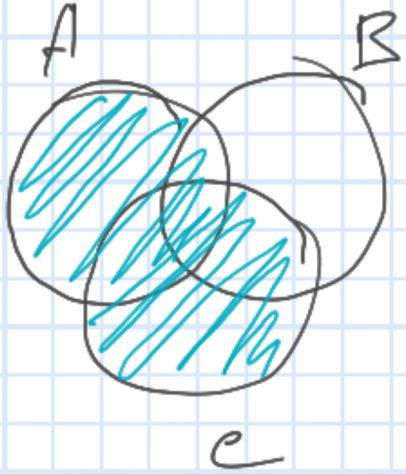
$A \cap C$

c.



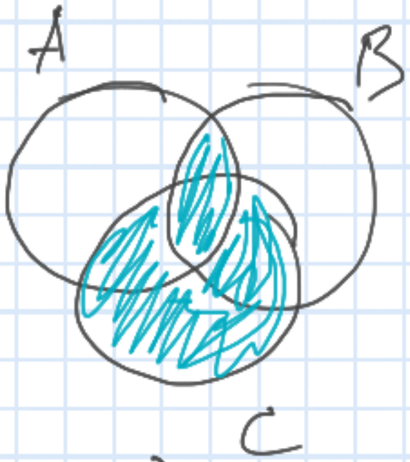
$A \cup B$

d.



$A \cup C$

e.

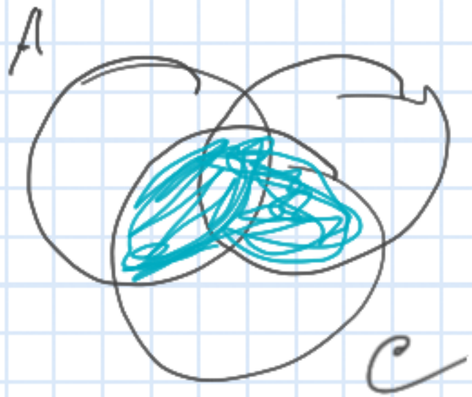


$(A \cap B) \cup C$

f

$(A \cup B) \cap C$

g. $(A \cap C) \cup (B \cap C)$



#5. $A = \{2, 5, 6, 8, 12, 19, 24, 32, 47\}$

a. $\{2, 5, 19, 47\}$

b. $\{6, 8, 12, 24, 32\}$

c. $\{2, 6, 8, 12, 24\}$

d. $\{5, 19, 47\}$

h. $\{2\}$

e. $\{\emptyset\}$

can be seen as m. of 3 and m. of 5.

f. $\{5, 3, 12, 24\}$

g $\{2, 8, 6, 12\}$

#6, a. $(x-1)(x+1) = x^2 + x - x - 1 = x^2 - 1$

b. $(a+1)(a+1) = a^2 + a + a + 1 = a^2 + 2a + 1$

c. $(x+5)(x+y+3) = x^2 + xy + 3x + 5x + 5y + 15 =$

$= x^2 + xy + 8x + 5y + 15$

d. $(k-1+d)(k-d) = k^2 - kd - k + d + kd - d^2 =$

$= k^2 - d^2 - k + d$

e. $\frac{2}{3} + 2x\left(\frac{1}{2} - \frac{1}{3}y\right) - x - \frac{1}{3}(2 - 2xy) =$

$= \frac{2}{3} + \frac{2x}{2} - \frac{2xy}{3} - x - \frac{2}{3} + \frac{2xy}{3} =$

$= x - \frac{2}{3}xy - x + \frac{2}{3}xy = 0.$

4 $2x^2(x+y) - 3x^2(x-y) = 2x^3 + 2x^2y - 3x^3 + 3x^2y =$

$= -x^3 + 5x^2y$

#17.

40 kg of see water 5% salt

$0.05 \cdot 40 = 2$ kg of salt.

$x \rightarrow$ how many kg. of fresh water.

$(40 + x) \cdot 0.02 = 2$

$0.8 + 0.02x = 2.$

$0.02x = 2 - 0.8 = 1.2$

$x = 1.2 : 0.02 = 60.$

check:

100 kg of water

have 2 kg of salt. $\frac{2}{100} : 0.02$ %.

#8.

$|m| = m \quad m \geq 0.$

$|m| = -m \quad m \leq 0$

$-m = |-m| \quad m \leq 0$

$m = |-m| \quad m \geq 0$

$m = -m \qquad m = 0.$

$m + |m| = 0 \quad m \leq 0.$

$m + |m| = 2m \quad m \geq 0.$

$m - |m| = 2m \quad m \leq 0.$