Algebra

$(a+b)(a-b)=a^2 - b^2$

$$\frac{\sqrt{10}}{\sqrt{5}} \equiv \sqrt{2}$$

$(a+b)^2 = a^2 + 2ab + b^2$

$(a-b)^2 = a^2 - 2ab + b^2$

$$\frac{a}{n} + \frac{b}{n} = \frac{a+b}{n}$$

Numere reale conjugale:

$\sqrt{5}+2$ are conjugatul $\sqrt{5}-2$

2X+7X=9X
2X-5X=-3X

2X → 2 coeficient
2X → X parte literala

2x –monom
2x+4y –binom
2x+4y-7 –tirnom

POLInoame

$(a+b+c)^2 = a^2 + b^2 + c^2 = 2ab+2ac+2bc$

(a+b)(x+y)=ax+ay+bx+by

ax + ay + bx + by = a(x+y)+b(x+y)=**(x+y)(a+b)**

Daca ab=0 => a=0 sau b=0
Daca |x|=3 => x=3 sau x=-3

Daca X^2 =25 => $\sqrt{x^2} = \sqrt{25} \Leftrightarrow |x| = 5 \Rightarrow$ X=5 sauX=-5 => $X \in \{5; -5\}$

! Pentru a rezolva o ecuatie de gradul 2 procedam astfel:

1) Trecem totzi termeni in membrul stang
2) Descompunem in factori membrul stang
3) Egalam fiecare factor cu 0 si gasim radacinile

Formula de rezolvare a ecuatie de gradul 2

$ax^2 + bx + c = 0$

1) a, b, c coeficienti
2) calculeaza discriminantul

$\Delta = b^2 - 4ac$

3)Aflam $x_1 = \frac{-b+\sqrt{\Delta}}{2a}$

$$x_2 = \frac{-b-\sqrt{\Delta}}{2a}$$

$2x^2 - 7x + 5 = 0$

a=2 b=-7 c=5

Δ= 49 -40 =9 ≥ 0

$$x_1 = \frac{-b+\sqrt{\Delta}}{2a} = \frac{7+3}{4} = \frac{10}{4} = \frac{5}{2};$$

$$x_2 = \frac{-b-\sqrt{\Delta}}{2a} = \frac{7-3}{4} = \frac{4}{4} = 1$$

Daca A(x; y)

B(x_2; y_2) atunci mij AB $\left(\frac{x_1+x_2}{2}; \frac{y_1+y_2}{2}\right)$

Dependenta funcionala:

Se numeste dependenta funcioonala intre 2 multimi nevide A,Bo corespondenta intre elementele luiA si elementele lui b care face ca la orice element din a sa-I corespunda un isngur element in B.

A=domeniu de definitie
B=codomeniu(multimea in care dependenta functonala ia valori)
Legea de corespondenta este al 3-lea element

Probabilitatea

Problema: Un pachet de carti are 52 carti.
Aflati probabilitatea extragerii:
a)unui 10
b)unui nr. prim
c)unui p.p.
d)unui nr. par

a)Sunt 4 carti cu 10 =>p $= \frac{4}{52} = \frac{1}{13}$

b)Nr prime sunt 2,3,5,7,13,11=>6x4=24 p $= \frac{4}{52} = \frac{1}{13}$

c)P.p sunt 1,4,9=>3x4 =12=> $= \frac{12}{52} = \frac{3}{13}$

d)Nr. pare sunt 2,4,6,8,10,12,14 =>7x4=28 p= $= \frac{28}{52} = \frac{7}{13}$

Probabilitatea= $\frac{nr.de-cazuri-favorabile}{nr.de-cazuri-posibile}$

(Proprietatile egalitatii cu nr. reale)
1)a=a(reflexivitate)

2)Daca a=b =>b=a(simetrie)
3)Daca a=b si b=c =>a=c(transitivitate)

Medii

Media Aritmetica $= \frac{x+y}{2}$

Media Geometrica $= \sqrt{x \cdot y}$

Media (h)Armonica $= \frac{2xy}{x+y}$

Media Ponderata $= \frac{a \cdot p^1 + b \cdot p^2}{p^1 + p^2}$

Mh< Mg< Ma

METODE DE REZOLVARE A SISTEMELOR DE ECUATIE
1)METODA GRAFICA
2)METODA SUBSTITUTIEI
3)METODA REDUCERII

MULTIMI

RELATII

∈ apartine

Y reunit

I intersectat

\- diferenta

X –produs cartezian

N –numere naturale:1,2,3
Z – numere intregi: -1;-2;0;2
Q – numere rationale:1,4;-5,4;3,(5)
R-Q –numere irationale: $\sqrt{5};-\sqrt{5};$
R - numere reale: $\sqrt{5};-\sqrt{5};$ -3,2; 2

$$0,x(y)=\frac{xy-x}{90}$$

$$n,x(y)=n\frac{xy-x}{90}$$

$$\sqrt{A\pm\sqrt{B}}=\sqrt{\frac{A+C}{2}}\pm\sqrt{\frac{A-C}{2}}unde-C=\sqrt{A^2-B}$$

MINIME:
1)Aflati valoarea minima a expresiei
$E(x)=x^2-10x+35$

$E(x)=x^2-10x+25+10$
$E(x)=(x-5)^2+10$ ⇔
⇔ $(x-5)^2\geq 0$ (V)xєR|+10 ⇔
⇔$(x-5)^2+10\geq 10$ =>E(x) ≥10 =>minE(x)=10

MAXIME

1)Aflati valoarea maxima a expresiei

$E(x)=-x^2-10x+20$ $x \in R$

$E(x)=-x^2-10x-25+45$

$E(x)=-(x^2+10X+25)+45$

$E(x)=-(x+5)+45$

$(x+5)^2 \geq 0$ |(-1) $\Rightarrow -(x+5)^2 \leq 0 \Rightarrow E(x) \leq 45 \Rightarrow$ max $E(x)=45$

Puteri

$$a^x \cdot a^y = a^{x+y}$$

$$(a^x)^y = a^{x \cdot y}$$

$$(a^2 \cdot b^3 \cdot c)^4 = a^8 \cdot b^{12} \cdot c^4$$