Prednáška č.1

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satko: matematicka analyza 1

MA

pocas semestral 40b za 2 testy v siedmom a desiatom tyzdni

treba aspon 20 bodov

skuska bude urcite pred vianocami v 13 tyzdni

**Reálna funkcia jednej reálnej premennej**

**Zjednotenie U, a zaroven je obratene v, alebo je v atd.**

Najdite definicny obor funkcie:

1. F(x) =3sqrt(2-ln x)

D(f): X > 0

D(f) = (0, nekonecno)

1. g(x) = ln(2cos x – sqrt(3))

2\*cos x – sqrt(3)>0

2cos x > sqrt(3)

Cos x > sqrt(3)/2

D(g) = (-pi/6+2kpi;pi/6+2kpi … nestihol som)

1. h(x) = sqrt(2-log0,5 x)

2-log0,5x >= 0

-log0,5 x >= -2

Log0,5 x <= 2

x>=1/4

a taktiez aj x > 0

D(h)=<1/4,nekonecno)

1. i(x) = sqrt(x-1/x+1)

x-1/x+1 >= 0

((x-1) >= 0 a zaroven (x+1)>0) zjednotene (x-1 <= 0 a zaroven x+1 < 0)

(X >= 1 a zaroven x>-1)zjednotene(x<= a zaroven x <-1)

D(i) = (-nekonecno,-1) zjednotene <1,nekonecno)

1. j(x) = arcsin(2x+1)

-1<=2x+1 a zaroven 2x+1 <=1

-2<=2x 2x<=0

x>=-1 a zaroven x <=0

D(j) = <-1,0>

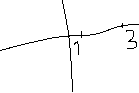
Arcus sa pohybujeme v intervale -1,1 (arcsin, arccos I think)

1. h(x) = arct(1/sqrt(x^2-4x+3))

x^2-4x+3>0



(x-3)(x-1)>0



x = 3 x = 1

D(h)=(-nekonecno,1)zjednotene(3,nekonecno)

**Nakreslite graf funkcie**

1. f(x) = ln(x)

**Diagram

Description automatically generated**

1. g(x) = -ln(x)

Chart

Description automatically generated

1. h(x) = ln(-x)

Chart

Description automatically generated

1. i(x) = |ln(x)|

Chart, histogram

Description automatically generated

1. j(x) = ln(x) + 2

Chart

Description automatically generated

1. k(x) = ln(x+2)

Chart

Description automatically generated

1. l(x) = 2 ln(x)

Chart

Description automatically generated

Priklad: zistite ci su funkcie proste a ak ano najdite k nim inverznu

1. f(x) =(x^3-3)/(2+x^3)

2+x^3 =/= 0

X^3 =/=-2

X=/=3sqrt(2)

D(f) = R- {3sqrt(-2)}

f(x1) = f(x2)

((x1)^3-3)/(2+(x1)^3) … nestihol som, zistovali sme ci je prosta (je)

Teraz si vyjadrime inverznu

f^-1: f(x) = (x^3-3)/(2+x^3)

f^-1: x = (y^3 – 3)/(2+y^3)

2x+xy^3=y^-3

xy^3-y^3 = -2x-3

y^3(x-1) = -2x-3

1. g(x) = (x^2 – 3)/(2+x^2)

2+x^2 =/=0

X^2 =/=-2 => D(g) = R

g(x1) = g(x2)

((x1)^2-3)/(2+(x1)^2) = ((x2)^2-3)/(2+(x2)^2

2(x1)^2+(x1)^2(x2)^2-6-3(x2)^2 = 2(x2)^2+(x2)^2(x1)^2-6-3(x1)^2

5(x1)^2=5(x2)^2 => nie je prostá

1. h(x) = 5+ln(x+1)

D(f): (-1,nekonecno)

h(x1) = h(x2)

5+ln(x1+1) = 5 + ln(x2+1)

x1 = x2 = > je prostá

f^-1: x = 5+ln(y+1)

x-5 = ln(y+1)

e^(x-5) = e^(ln(y+1))

y+1 = e^(x-5) =>y = e^(x-5)-1