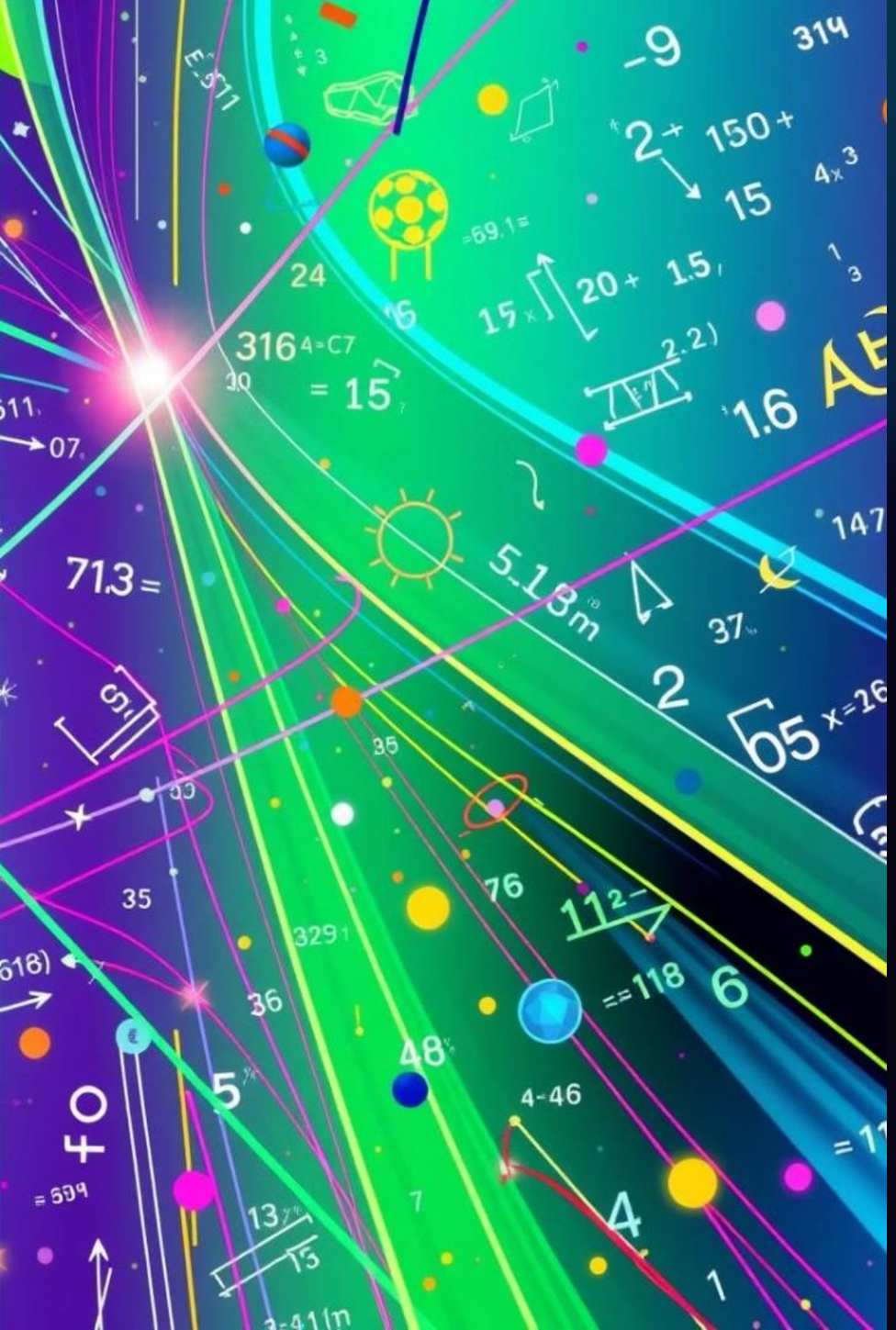


Ratsional ko′rsatkichli daraja va uning xossalari

Ushbu taqdimotda ratsional ko'rsatkichli darajalar, ularning xossalari va matematikada qanday qo'llanilishi muhokama qilinadi.

LB **by Lazizbek Baxriddinov**

n-darajali arifmetik ildizning ta′rifi va xossalari

Ta′rif

n-darajali arifmetik ildiz bu a sonning n-darajasi a sonni beradigan sondir.

Xossalari

n-darajali arifmetik ildizning xossalari quyidagilar:

- Ildiz ostida manfiy son bo'lishi mumkin emas.
- Agar n toq son bo'lsa, ildizning bir yechimi bo'ladi.
- Agar n juft son bo'lsa, ildizning ikki yechimi bo'ladi.

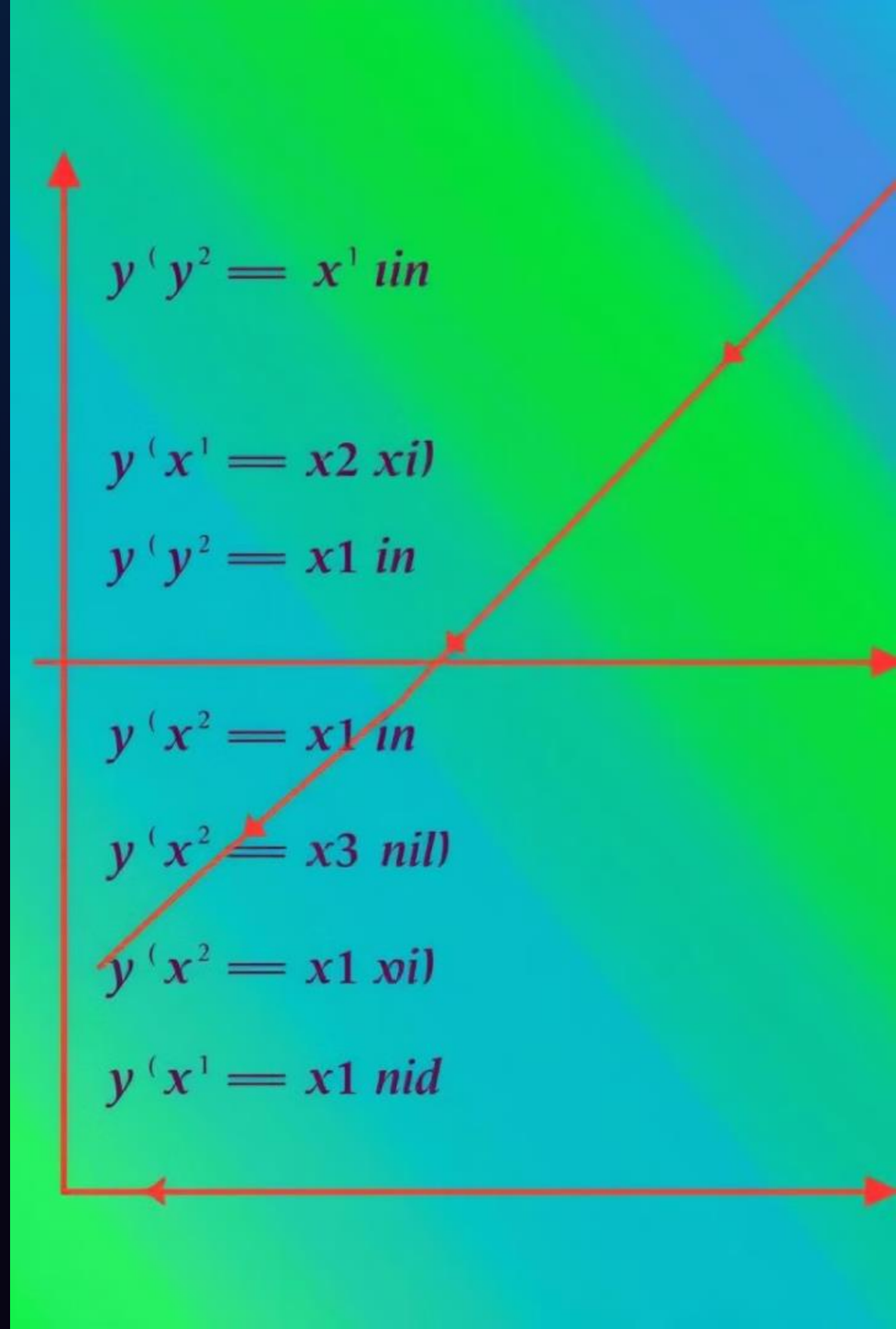
Musbat va manfiy n-darajali ildizlar

1 **Musbat ildiz**

Musbat n-darajali ildiz bu musbat sonning n-darajasi musbat sonni beradigan sondir.

2 **Manfiy ildiz**

Manfiy n-darajali ildiz bu musbat sonning n-darajasi manfiy sonni beradigan sondir.



Ratsional koʻrsatkichli darajaning taʻrifi va xossalari

Taʻrif

Ratsional ko'rsatkichli daraja bu a sonning m/n shaklidagi ko'rsatkichli darajasi bo'lib, u a sonning m-darajasining n-darajali arifmetik ildizini anglatadi.

Xossalari

Ratsional ko'rsatkichli darajaning xossalari:

- (a^m)^n = a^(m*n)
- a^(m/n) = (a^m)^(1/n) = (a^(1/n))^m
- a^(m/n) = (a^(1/n))^m

Ratsional ko′rsatkichli darajaning xossalaridan baholash

Yig′ish

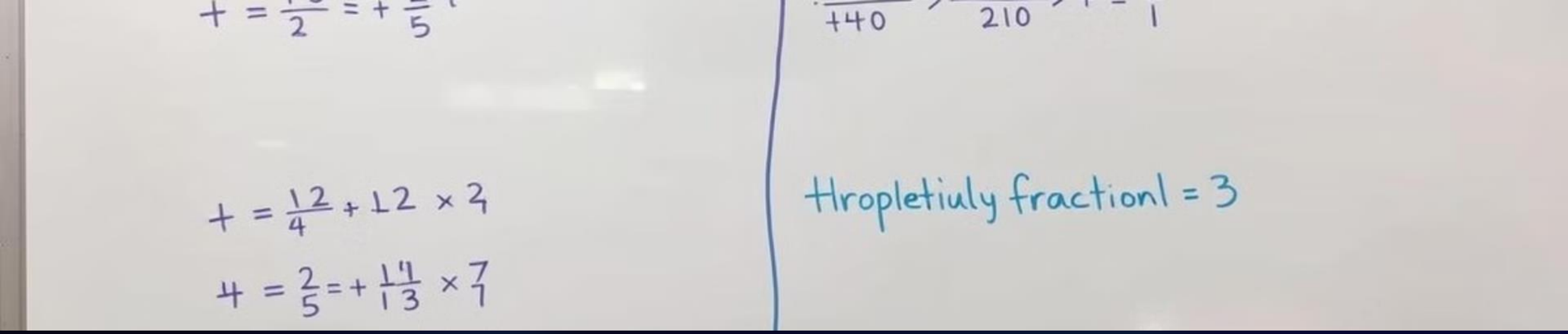
Agar a sonning m/n va p/q darajalari bo'lsa, ularni yig'ish uchun quyidagi formuladan foydalanish mumkin: a^(m/n) + a^(p/q) = a^((mq+pn)/(nq)).

Ko′paytirish

Agar a sonning m/n va p/q darajalari bo'lsa, ularni ko'paytirish uchun quyidagi formuladan foydalanish mumkin: a^(m/n) * a^(p/q) = a^((mp+nq)/(nq)).

Bo′lish

Agar a sonning m/n va p/q darajalari bo'lsa, ularni bo'lish uchun quyidagi formuladan foydalanish mumkin: a^(m/n) / a^(p/q) = a^((mq-pn)/(nq)).



Ratsional ko′rsatkichli darajalarni yig′ish va ko′paytirish

Yig′ish

a^(m/n) + a^(p/q) = a^((mq+pn)/(nq)).

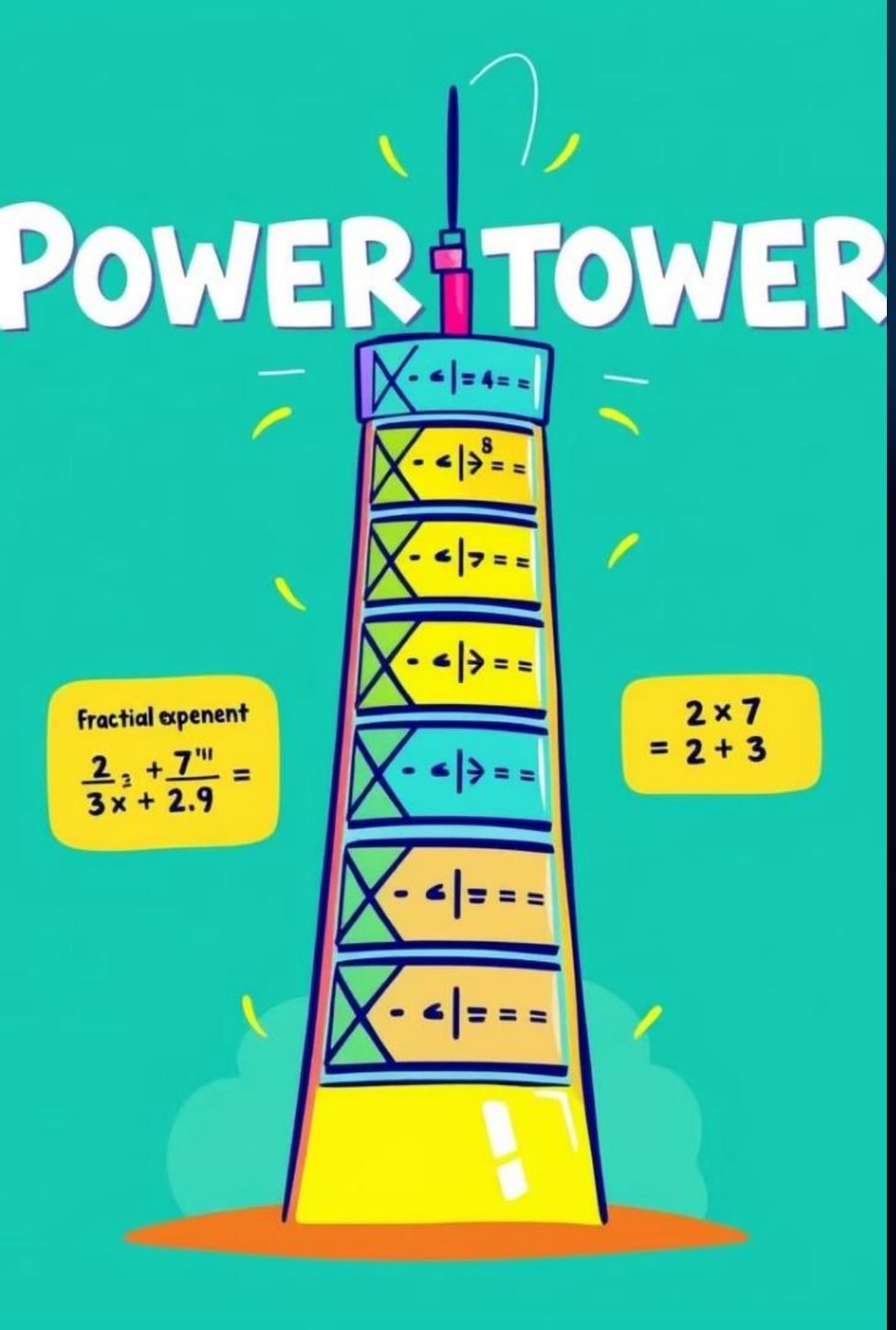
Ko′paytirish

a^(m/n) * a^(p/q) = a^((mp+nq)/(nq)).

Ratsional ko′rsatkichli darajalarni bo′lish

1. a^(m/n) / a^(p/q) = a^((mq-pn)/(nq)).

2. Ushbu formula yordamida ratsional ko'rsatkichli darajalarni bo'lishda, ularning ko'rsatkichlarini olib tashlash va natijani a sonning yangi ko'rsatkichli darajasi sifatida ifodalash mumkin.



Ratsional ko′rsatkichli darajani darajaga ko′tarish

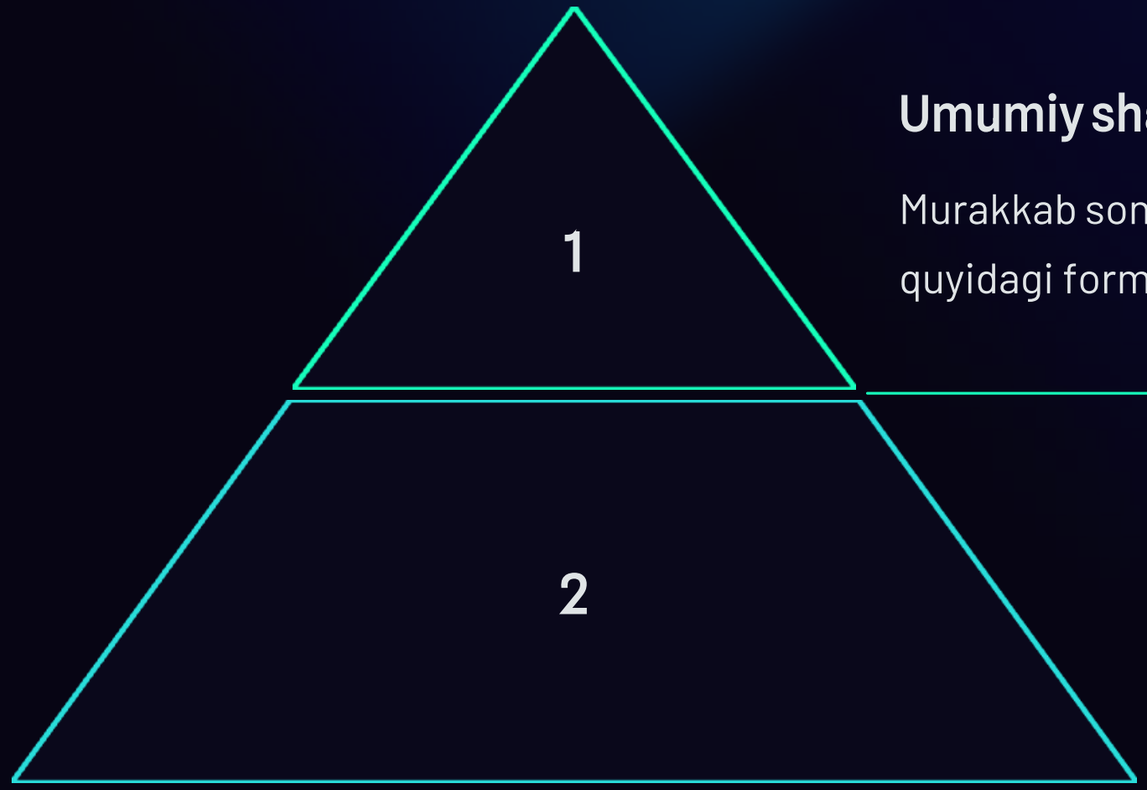
1

a^(m/n)^p = a^((m*p)/n).

2

Ushbu xossani qo'llashda, ko'rsatkichlarni ko'paytirish va natijani a sonning yangi ko'rsatkichli darajasi sifatida ifodalash mumkin.

Murakkab sonlarni ratsional ko′rsatkichli daraja shaklida yozish



Umumiy shakl

Murakkab sonlarni ratsional ko'rsatkichli daraja shaklida yozish uchun quyidagi formuladan foydalanish mumkin: z = r(cos θ + i sin θ) = r(e^(iθ)).

Misol

Masalan, 2 + 2i sonini ratsional ko'rsatkichli daraja shaklida ifodalash uchun quyidagilarni bajaramiz: z = 2√2(cos(π/4) + i sin(π/4)) = 2√2(e^(iπ/4)).

Amaliy masalalar yechish

1

Masala 1

a^(2/3) * a^(1/2) ni hisoblang.

2

Yechim

a^(2/3) * a^(1/2) = a^((4+3)/6) = a^(7/6).

3

Masala 2

√(a^3) ni ratsional ko'rsatkichli daraja shaklida yozing.

4

Yechim

√(a^3) = a^(3/2).