

# Funksiya

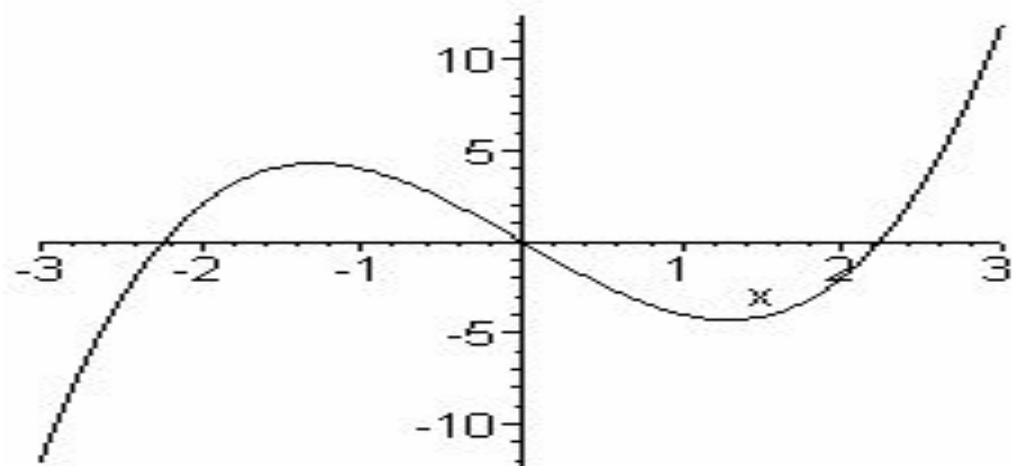
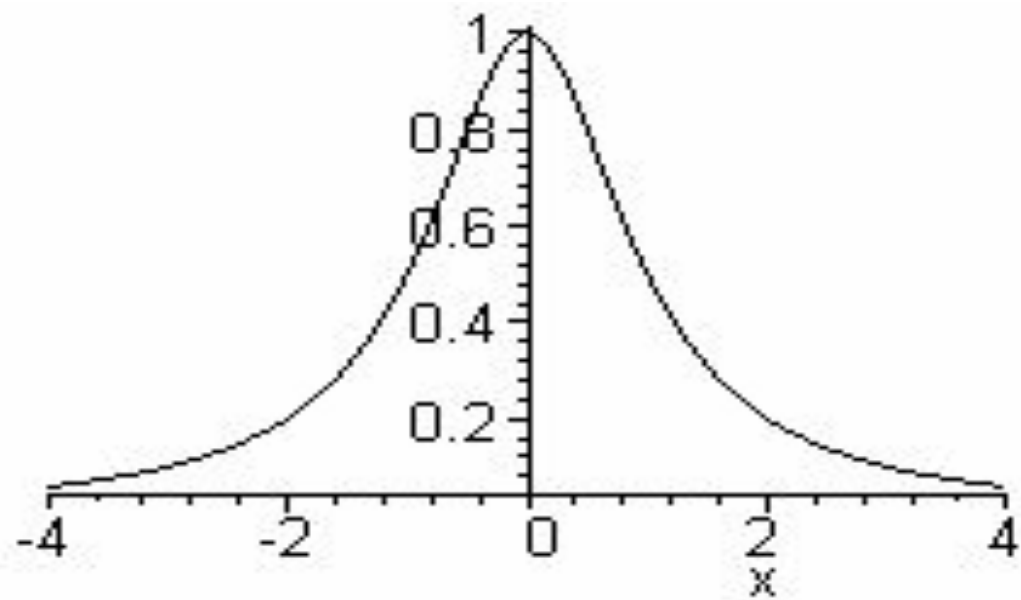
- Funksiya ta'rifi.
- Funksiyaning aniqlash va o'zgarish sohasi
- *Funksiyaning berilish usullari*
- Funksiya xossalari
- *Ba'zi iqtisodiyotdada ishlatiladigan funksiyalar*

# *Funksiyaning berilish usullari*

- Analitik usul
- Jadval usul
- Grafik usul

# Funksiya xossalari

- Funksiyaning juft-toqligi
- Funksiya monotonligi
- Davriy funksiya
- Oshkor va oshkormas funksiya
- Teskari funksiya
- Chegaralangan funksiya

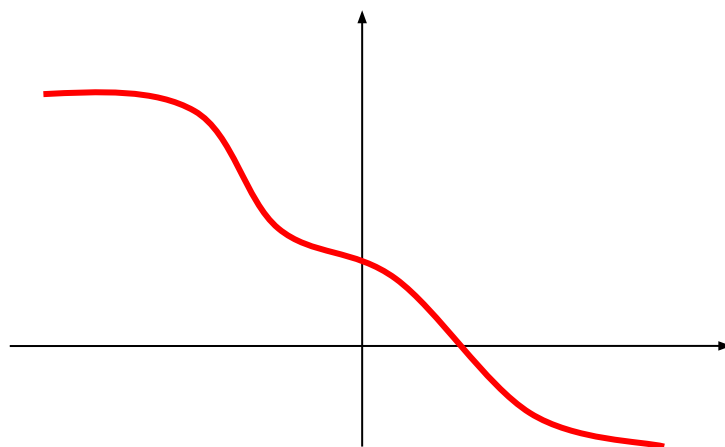
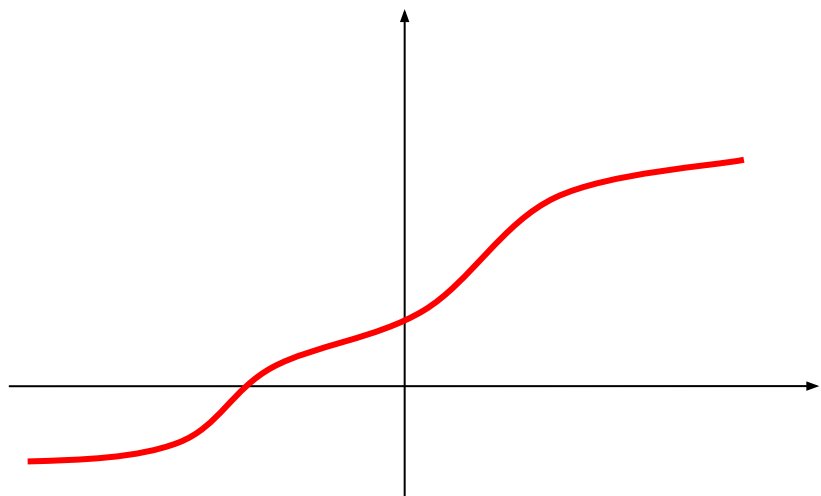


## Funksiya monotonligi

$$x_1 < x_2$$

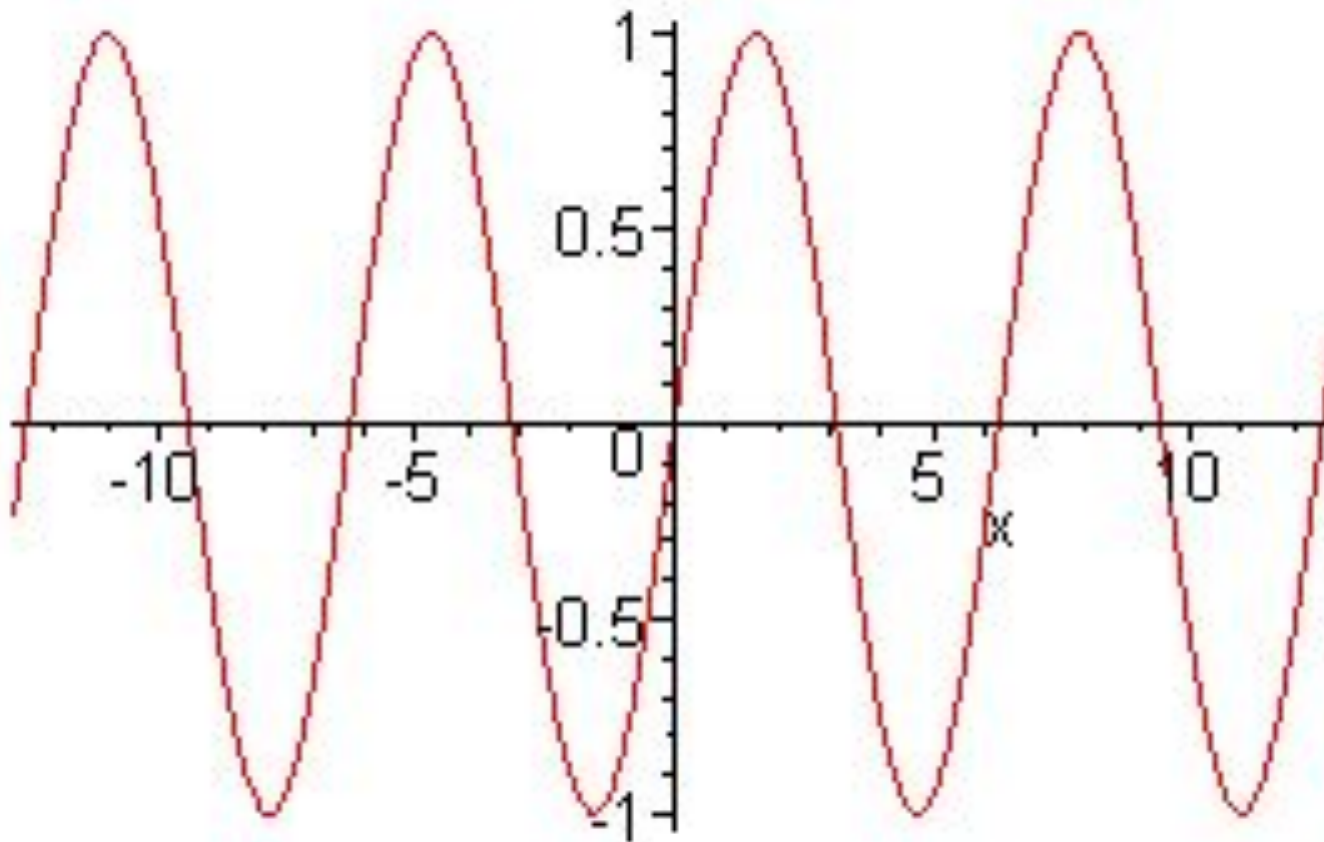
$$f(x_1) < f(x_2)$$

$$f(x_1) > f(x_2)$$



Davriy funksiya

$$f(x + T) = f(x) \quad (T \neq 0)$$



Oshkor va oshkormas funksiya

$$F(x, y) = 0$$

$$y = 3x^2 + 1$$

$$x^4 + y^2 - x = 0$$

## Teskari funksiya

$$y = f(x) \qquad y = f^{-1}(x)$$

$$y = a^x \qquad y = \log_a x$$

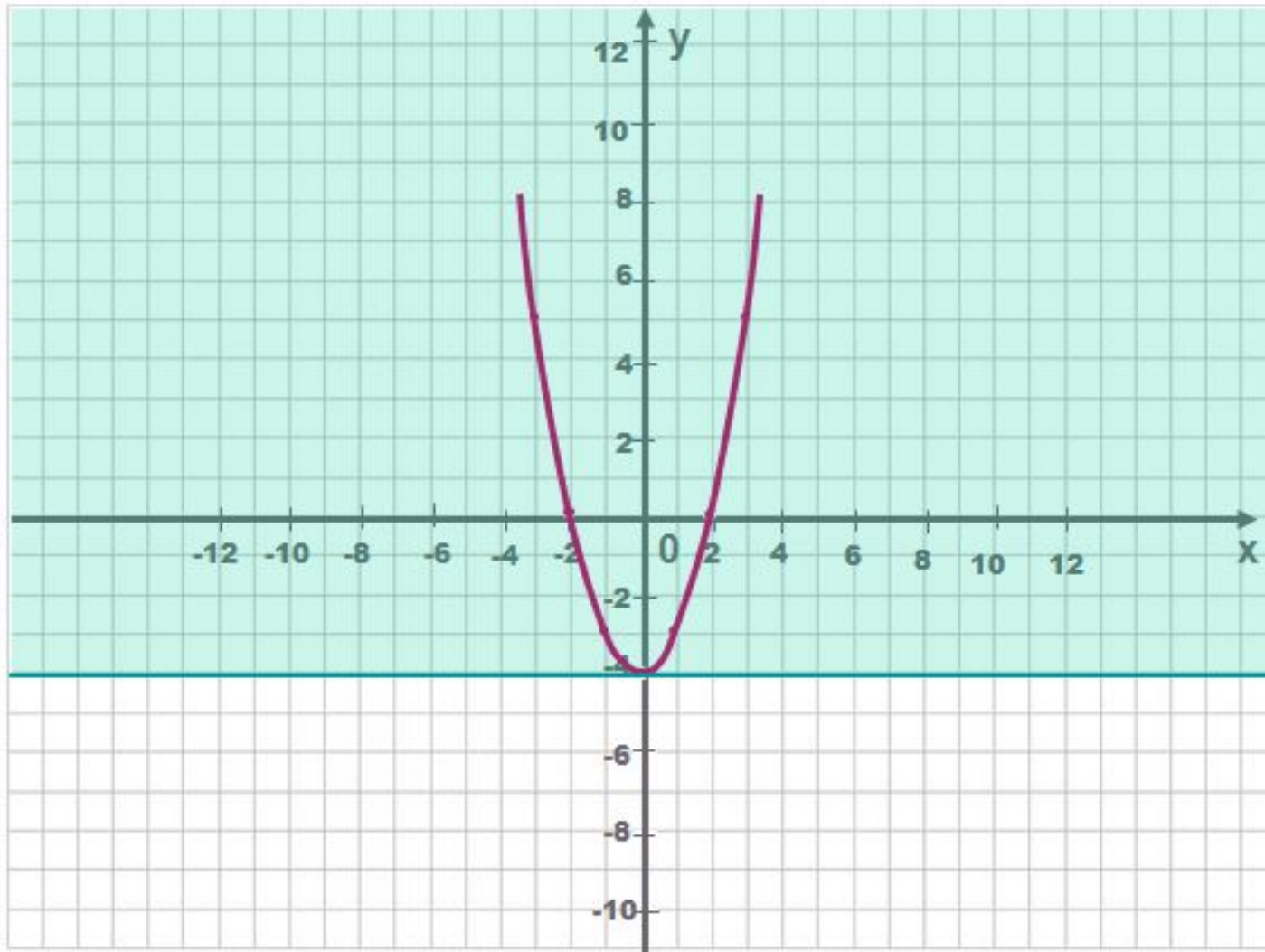
## Murakkab funksiya

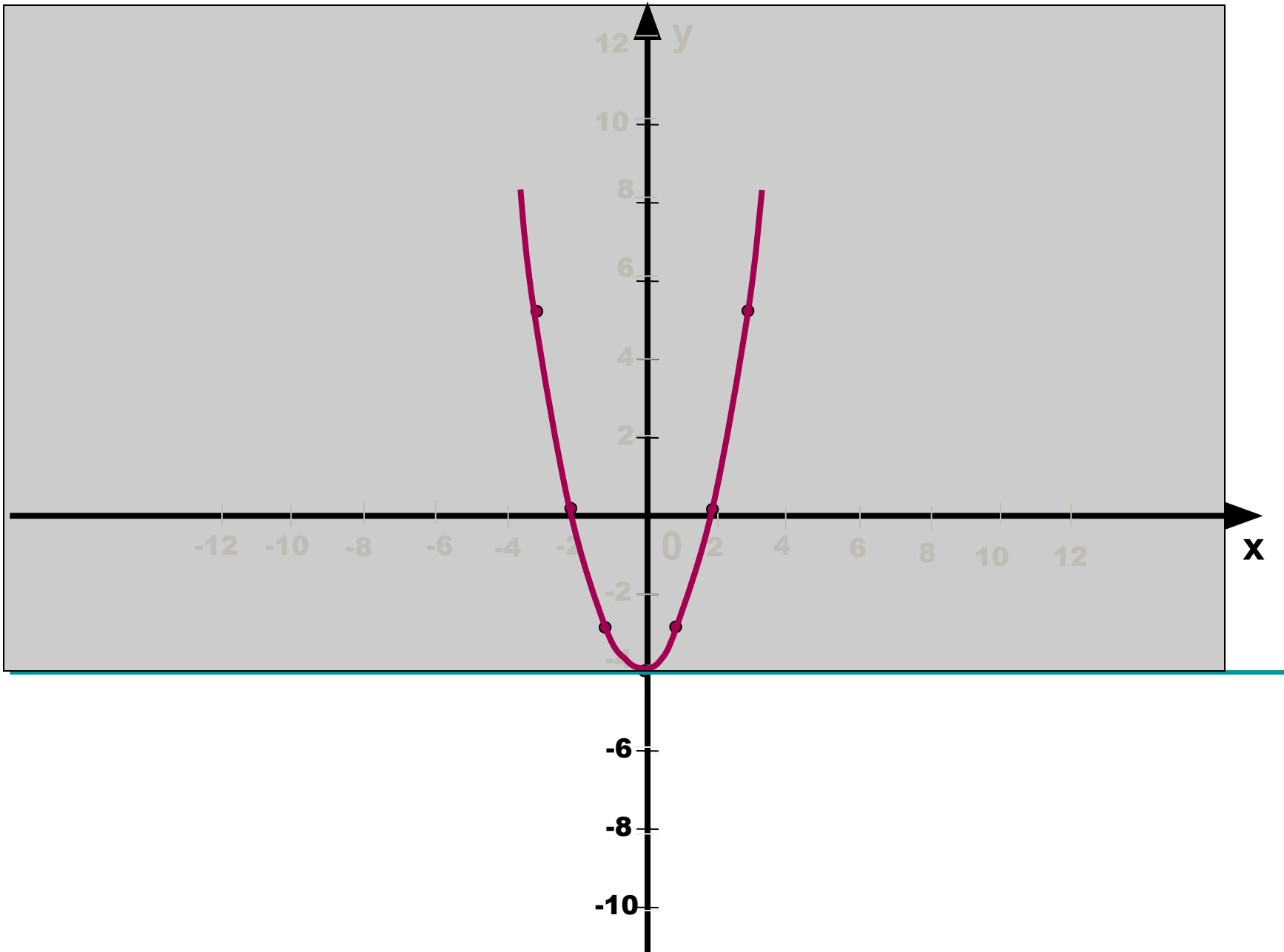
$$y = \cos \ln x$$

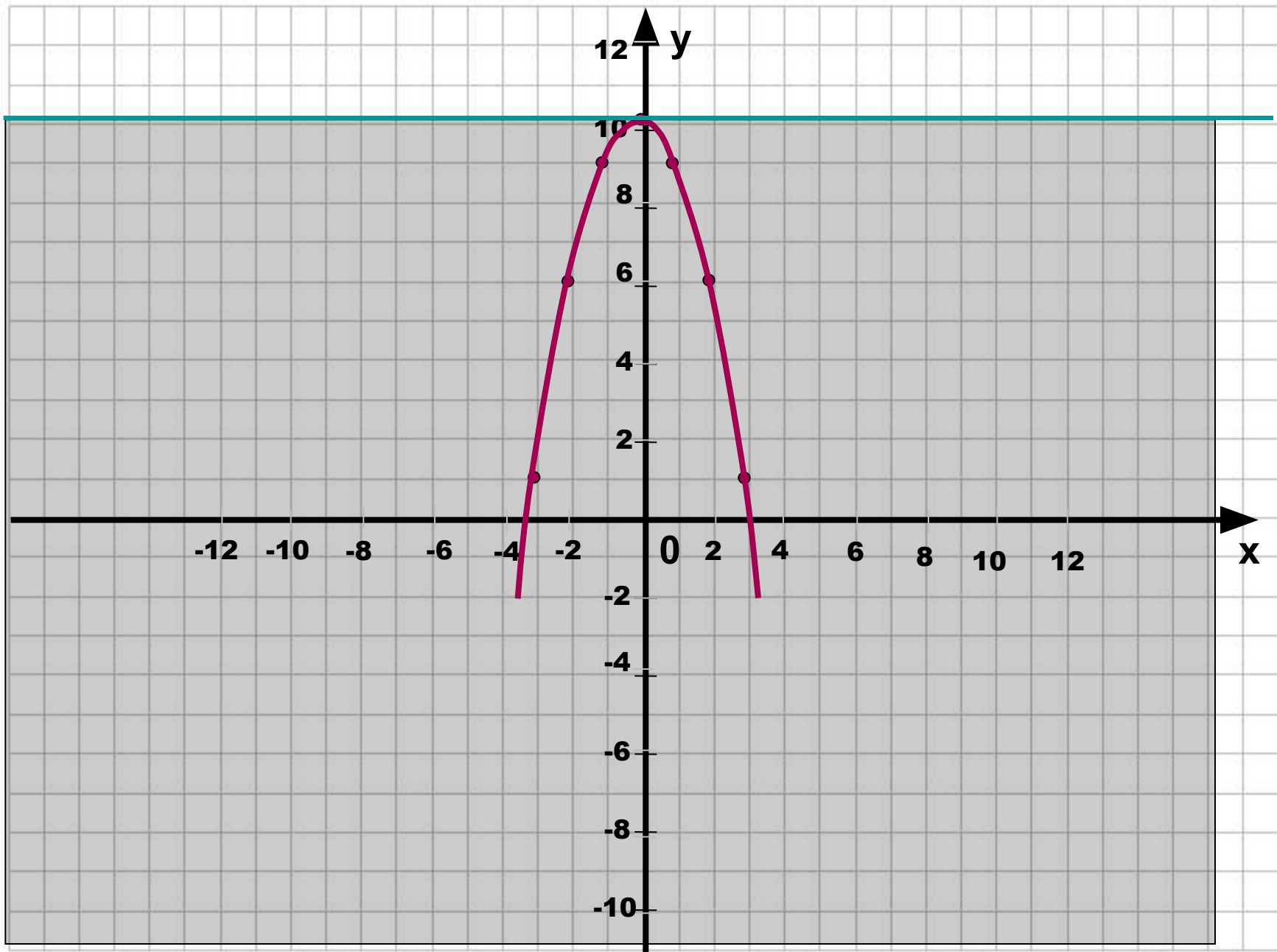
$$y = \cos z, \quad z = \ln x$$

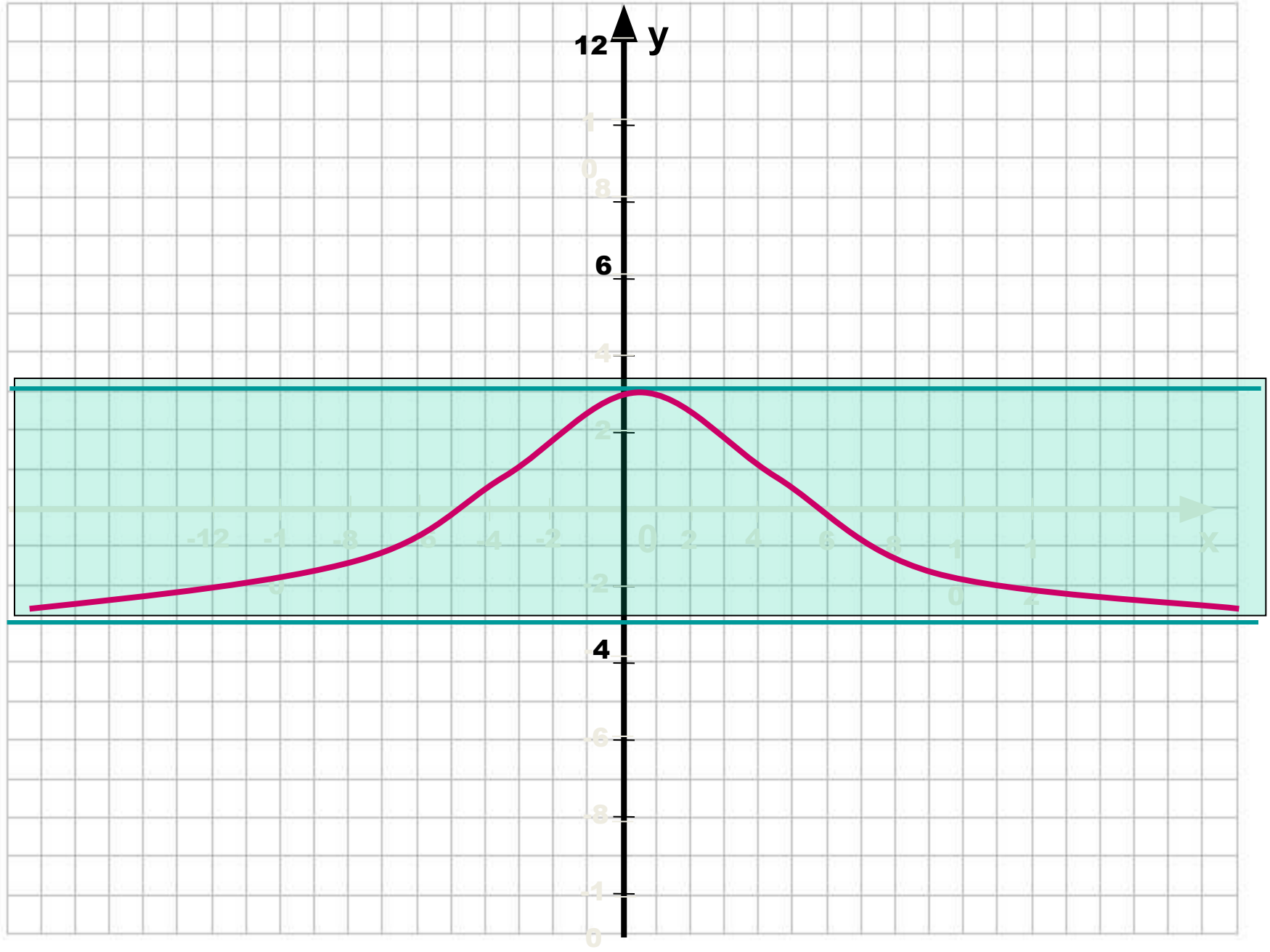


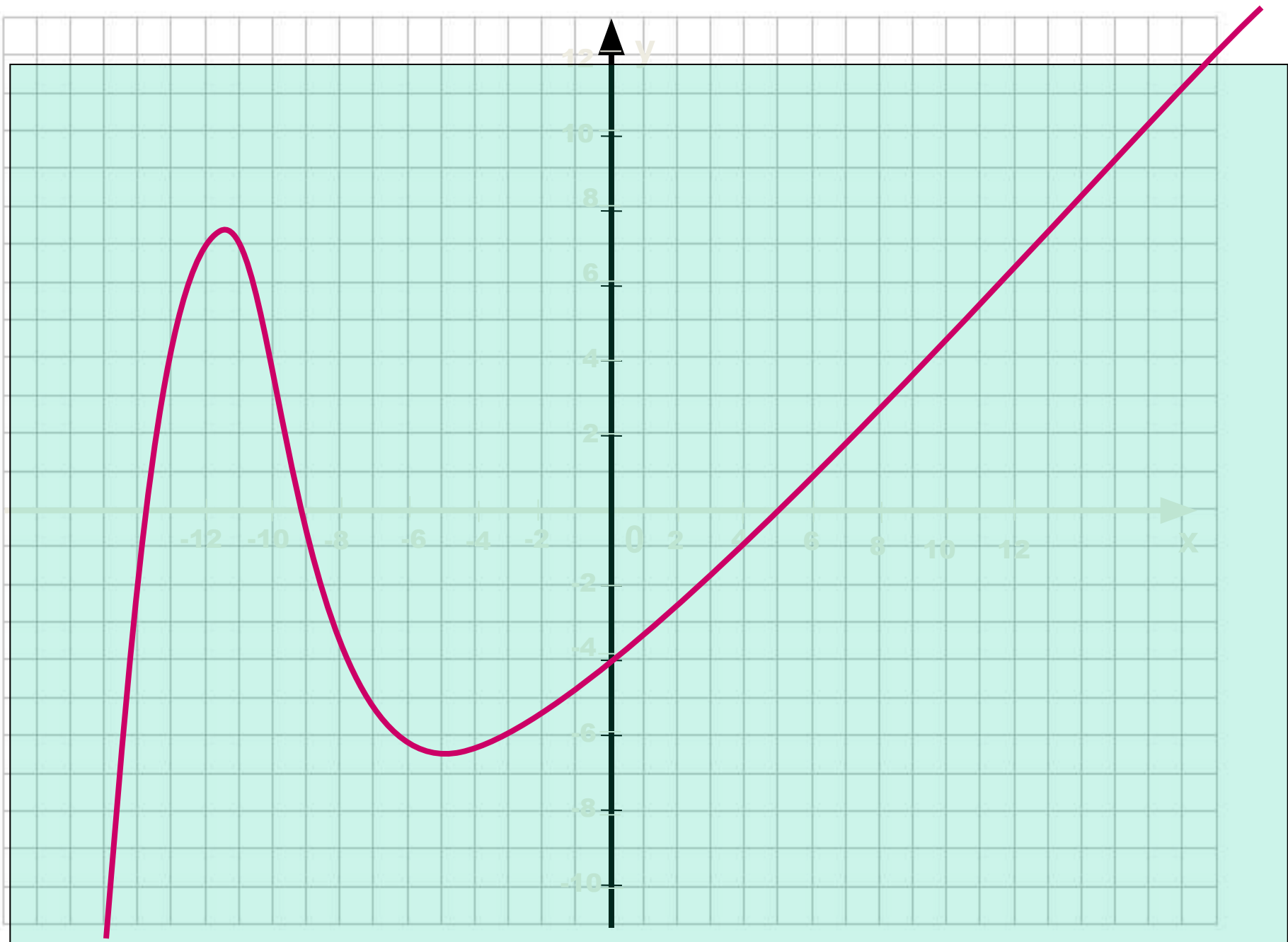
# Chegaralangan funksiya











# *Ba'zi iqtisodiyotdada ishlatiladigan funksiyalar*

- *Xarajat funksiyasi*
- *Kirim funksiyasi*
- Foyda funksiyasi
- Talab funksiyasi
- Taklif funksiyasi

## *Xarajat funksiyasi*

$$C(x) = mx + b$$

Ishlab chiqaruvchining o'zgarmas harajati \$200 bo'lib, har bir chiqarilgan mahsulot uchun esa \$50 sarf qiladi. Umumiy harajatni ishlab chiqariladigan mahsulot xajmi orqali ifodalovchi funksiyani toping.

$$C(x) = 50x + 200$$

*Kirim funksiyasi*

$$R(x) = mx$$

*Foyda funksiyasi*

$$P(x) = R(x) - C(x)$$



Misol. Tovarning sotilish narxi 0,40\$ . O'zgarmas xarajat 200\$ har bir tovar uchun ketgan xarajat esa 0,20\$ bo'lsa,

- a) umumiy xarajatni
- b) umumiy kirimn va
- c) foyda funksiyalarini toping.

Yechish. a) umumiy xarajat .  $C(x) = 200 + 0,20x$

b) kirim funksiyasi:  $R(x) = 0,40x$

c) foyda funksiyasi-

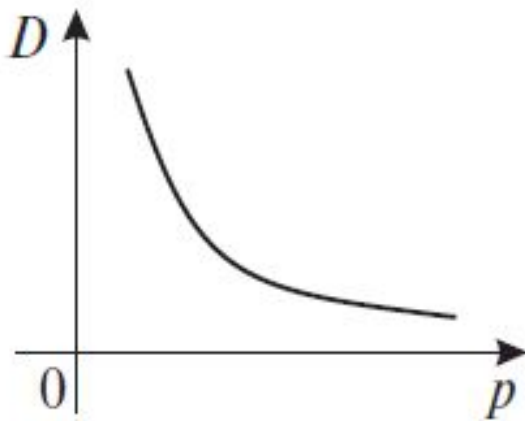
$$P(x) = 0,40x - (200 + 0,20x)$$

$$P(x) = 0,20x - 200$$

# Talab va Taklif funksiyasi

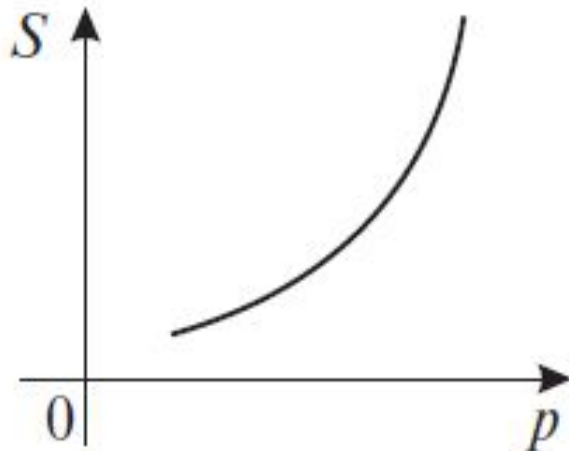
**Talab funksiyasi.** Bu funksiya  $D(p)$  orqali ifodalanib, pul birligida sotilishi mumkin bo'lgan tovarlar sonini bildiradi

$$D(p) = ap^{\alpha} + b, \quad a > 0, \quad b > 0, \quad \alpha < 0$$



**Taklif funksiyasi.** Bu funksiya  $S(p)$  orqali ifodalanib, bu narxda ishlab chiqaruvchining taklif qilgan tovarlar sonini bildiradi.

$$S(p) = cp^{\beta} + d, \quad c > 0, \quad d > 0, \quad \beta \geq 1$$



# muvozanat narx

