$n \le 21$ $\quad m^3 = n^3 + 13n - 273$ $\quad \boxed{n=1}$

$n^3 - 260 = m^3$

$n^3 - (n-a)^3$

512
104

343
273
616

$(n-a)^3 = n^3 - a^3 - 3na(n-a) = n^3 - a^3 - 3an^2 + 3a^2 n$

$a^3 + 3an^2 - 3a^2 n = 273 - 13n$

$a(a^2 + 3n^2 - 3an) = 13(21-n)$

$n^3 + 13n - 273 > 0$

$n = 5$ $\quad \boxed{n=6}$

125 $\quad$ 216
65 $\quad$ 78 − 273
180

21

$\boxed{a=13}$

$169 + 3n - 39n = 21 - n$

$4n - 39n = -148$

$35n = 148$

$\boxed{n=7}$

$96 + 6 \cdot 4 = 120$

9 11 13 15.

$24 + 24 = 48$

$\frac{48}{2} \cdot 96$

$a^3 - m^3 = 273 - 13n$

$\boxed{n > 13}$

9 ta + 8 + 8

9 + 8 + 8

7 + 4 + 3

96
24
120

$6 \cdot 4 = 24$ $\quad n^3 - m^3 = (21-n)13$

$12 + 14$

$21^3 - 20^3 = (20+1)^3 = \cancel{20^3} + 1^3 + 3 \cdot 20(21) - \cancel{20^3}$

$3 \cdot 20 \cdot 21 + 1 = 1261$

$(n-2)^3 = n^3 - 8 - 3n \cdot 2(n-2) =$

$= \cancel{n^3} - 8 - 6n^2 + \cancel{12n} < \cancel{n^3} + \cancel{13n} - 273$

$0 < 6n^2 + n - 265$

343 + 91
273
70
91

512
− 104
273

$(n^3 - 3n^2 + 3n - 1) + (10n + 3n^2 + 272)$

$4 + 3 + 2 + 1$ $\quad$ 9 talik

3 + 2 + 1
2 + 1
1

10 talik
11 talik
12 talik

616
273
$m = 343$

7 + 8 + 9 + 8 + 7 + 6 + 5 + 4 + 3 $\quad$ 2 ta lik

8 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 $\quad$ 3 ta lik

9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 $\quad$ 4 ta lik

8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 ← $\quad$ 5 ta lik

7 + 6 + 5 + 4 + 3 + 2 + 1 $\quad$ 6 ta lik

6 + 5 + 4 + 3 + 2 + 1 $\quad$ 7 ta lik

5 + . . 1 $\quad$ 8 ta lik

$\boxed{n<21}$

$\boxed{m^3 < n^3}$

$3n^2+3n+1=13n-273$

$3n^2=10n-274$

$3n^2-10n+274=0$

$D=10^2- \quad <0$

$n^3 \quad (n-1)^3 = n^3-1-3n^2+3n$

$\cancel{n^3}-3n^2+3n-1=\cancel{n^3}+13n-273$

$-3\cdot n\cdot 1\,(n-1)$

$-3n^2-1=10n-273$

$3n^2+10n-272=0$

$D=100+12\cdot 272$

$n^3-260=m^3$

$n^3-m^3=260$

$n<21$

$n-m=13$

$(n-m)(m^2+mn+n^2)=260$

$m^2+mn+n^2=20$

$m^2+m(m+13)+(m+13)^2=20$

$2m^2+13m+m^2+26m+169=20$

$3m^2+39m+149=0$

$y+\sqrt{x}=0$

$\boxed{y=-\sqrt{x}}$

$\boxed{y=x^2}$

$x=9$

$y=-\sqrt{3}$

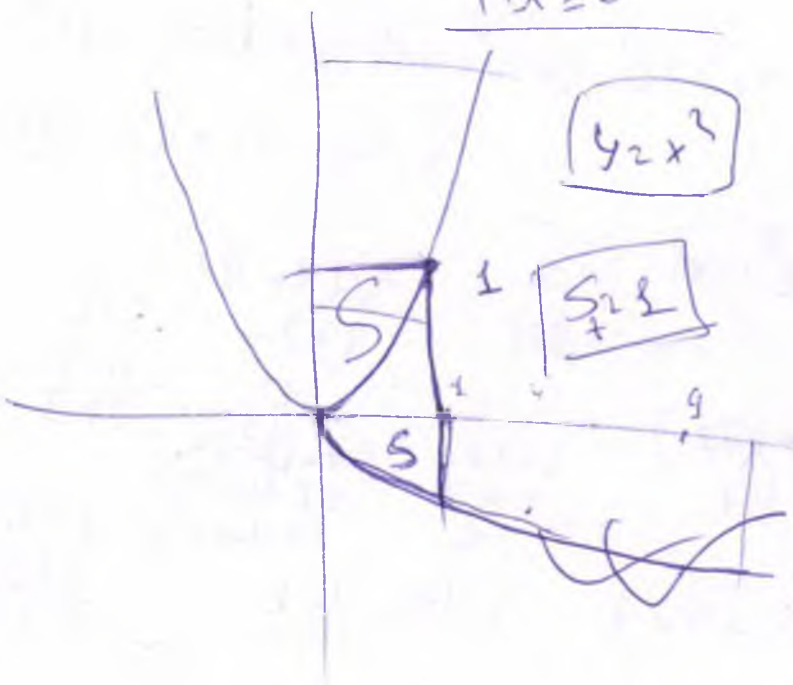
$y=\sqrt{x}$

$0<x\leq 1$

$x=0{,}7$

$y=-\sqrt{0{,}7}$

$1\geq x\geq 0$



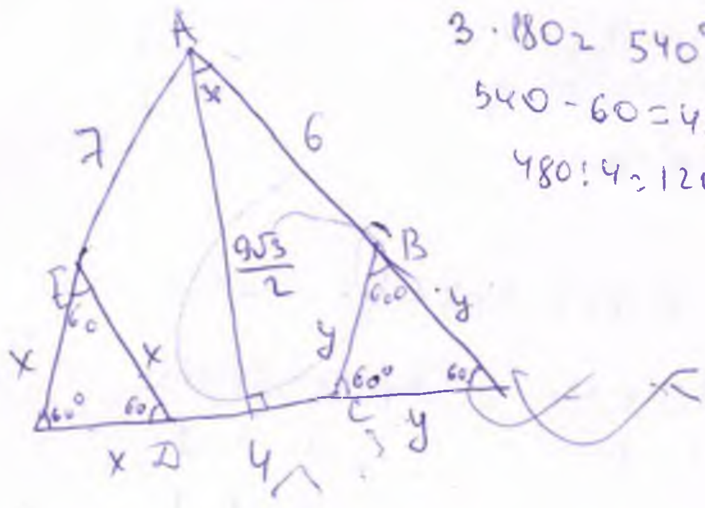
$\boxed{y=x^3}$

$\boxed{S=\frac{1}{7}}$

$-0{,}7+$

$0{,}82$

$-0{,}3+\sqrt{0{,}7}$



$3 \cdot 180 = 540°$

$540 - 60 = 480$

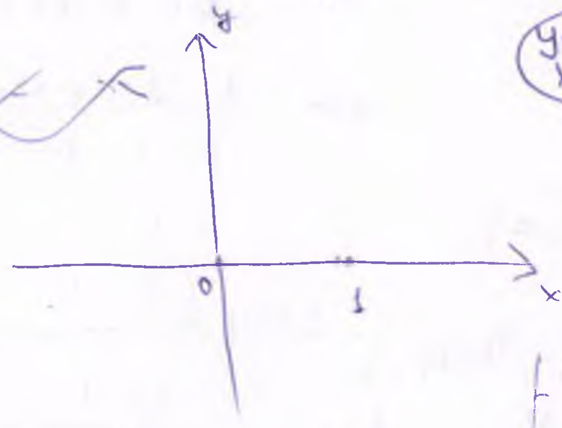
$480 : 4 = 120°$

$(y+\sqrt{x})(y-x^2)\sqrt{1-x} \le 0$

$1 - x \ge 0$

$\begin{cases} x \le 1 \\ x \ge 0 \end{cases}$ $\boxed{0 \le x \le 1}$

$y = 0$
$x = 0$



$7 + x = 6 + y = 4 + x + y$

$7 + x = 4 + x + y$

$\boxed{3 = y}$

$\boxed{x = 2}$

J: $\frac{9\sqrt{3}}{2}$

$-3 \cdot 2 < 0$

$-3 < 0$

$3 \cdot 2 > 0$

$3 > 0$

$(y+\sqrt{x})(y-x^2) \le 0$

$\begin{cases} y + \sqrt{x} \ge 0 \\ y - x^2 \le 0 \end{cases}$

$y \le x^2$

$0 \le (x - \sqrt{y})(x + \sqrt{y})$

$+ \quad - \quad +$

$-\sqrt{y} \quad \sqrt{y}$

$\cancel{\sqrt{x} \ge y}$

$y \ge -\sqrt{x}$

$y + 0$

Eng minimal kvadrat

$2 \cdot 9 + 2 \cdot 11 + 2 \cdot 13 + 2 \cdot 15 =$

$= 2 \cdot 24 \cdot 2 = 96$

$64 + 96 = 120$

$6 <$

1-qator: $2 +$

N X

1 2 3 4 ... n

x_1 x_2 x_3 x_n x_n

a a a a a

$(x_1, x_2, x_3 \ldots x_n) = 0, 1, 2$

$\sqrt{y} \le x$

$y \le x^2$

$0 \le x^2 \le 1$

1ta bola

$\boxed{n = 3}$

$na = x_1 + x_2 + x_3 + \ldots + x_n$

1 2 3 4 5 6 7

1 1 1 1 1 1 1

1 1 1 1 1 1 1

n - 2 ta

$0 + 1 + \ldots + n - 1 =$

$= \frac{n(n-1)}{2} = na$

$\boxed{n - 1 = 2a}$

$n = 2k + 1$

1 2 3

1 1 1

$0 + 1 + 2 = 3$

1 2 3 4 5

1 1 1 1 1

1 1 1 1 1

2 tadan

1 2 ... (n-1) n

1 1 1 ... 1 1

1 ... 1 1

1 1 1

$a - 1$

k-1

$2k + 1$

$k + 1 - k$

$\cancel{n + k - k = k}$

$1 \ldots 2k+1$

$1+2+3=\boxed{6}$

$6+4+5=\boxed{15}$

n^3+13n-

$\underbrace{\quad}_{2k-1}$

$\boxed{2k-2}$

$1 \ldots k-1 \quad k \quad k+1 \quad k+2 \quad k+3 \ldots 2k+1$

a ta $1 \; 2 \; 3 \; 4 \ldots 2k-2 \; 2k-1 \; 2k \; 2k+1$

$(2k+1-a)$

$2k+1$

$1 \; 2 \ldots k, 2k+1$

$2k \quad 1$

$2k-2$

$4 \quad 2k-1 \quad 2k-3 \quad 2k+3 \quad \boxed{k}$

$\boxed{k+1}$

$3 \quad 2k \quad k+1$

$\boxed{k+2}$

$\boxed{n=2k+1}$

$n^3+13n-273$

$3n^2+3n+1 > 0$

$3n^2-10n+274>0$

$1 \; 2 \; 3 \; 4 \; 5 \; 6 \; 7 \; 8 \; 9 \; 10 \; 11$

$(n+1)^3 > m^3 > n^3$

$n^3+13n-273$

n^3+3n^2+3n+1

$3n^2-10n+274 > 0$

$n=2k+1$

$\boxed{k=5}$

$m^3=n^3+(13n-273 \quad \boxed{n=21}$

$(m-n)(m^2+mn+n^2)=13n-273$

$m^3-a^3=n^3+13n-273-a^3$

$(m-n)(m^2+mn+n^2)=13(n-21)$

$\boxed{n \geq 21}$

$m-n=13k$

$m=13k+n$

$(n+1)^3=n^3+3n^2+3n+1$

$\cancel{13}k((13k+n)^2+(13k+n)n+n^2)=\cancel{13}(n-21)$

$3n^2-10n+274$

$k(169k^2+26kn+n^2+13kn+n^2+n^2)=n-21$

$(n+1)^3-m^3=3n^2-10n+274$

$k(169k^2+39kn+3n^2)=n-21$

$D<0$

$(n+1)^3>m^3>n^3$

$1+3+6+10+15+21+28+36+45+5 \quad ?+5?$

$4 \quad 10 \quad 20 \quad 35 \quad 56 \quad 84 \quad 120 \quad 165$

109

274

274

2

548

120

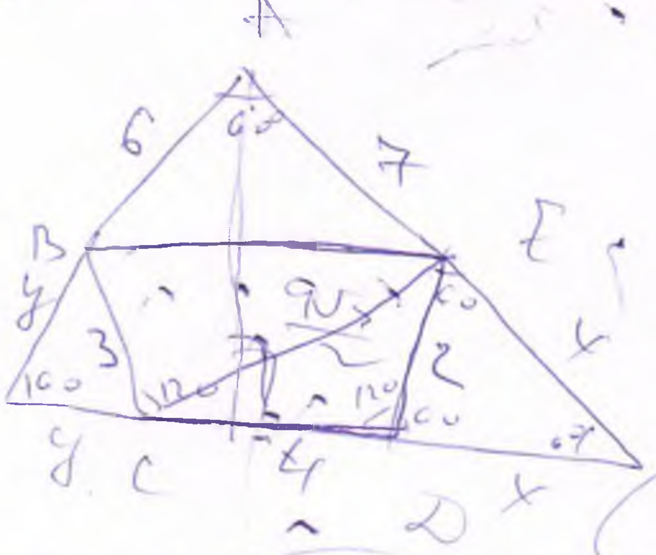
$\boxed{668}$

$n<21$

$n<21$ da

273

$\boxed{n^3 = n^3 - a}$



$n \geq 8$

$n^3+13n-273$

n^3+3n^2+3n+1

$x=2 \quad y=3 \quad 9$

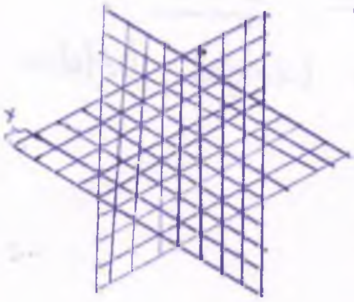
$k+1 \quad k+2$

$1 \quad 2 \quad 3 \quad 4 \quad \ldots \quad 2k \quad 2k+1$

Har bir kesmachani x deb belgiladim.

N1.

Tomoni x bölgan Δ lar: 120 ta



Tomoni 2x Δ lar

$(7+8+9+8+7+6+5+4+3)\,2$

Tomoni 3x Δ lar $(8+9+8+7+6+5+4+3+2)\,2$

Tomoni 4x Δ lar $(9+8+7+6+5+4+3+2+1)\,2$

Tomoni 5x Δ lar $(8+7+6+5+4+3+2+1)\,2$

Tomoni 6x Δ lar $(7+6+5+4+3+2+1)\,2$

Tomoni 7x Δ lar $(6+5+4+3+2+1)\,2$

Tomoni 8x Δ lar $(5+4+3+2+1)\,2$

Tomoni 9x Δ lar $(4+3+2+1)\,2$

Tomoni 10x Δ lar $(3+2+1)\,2$

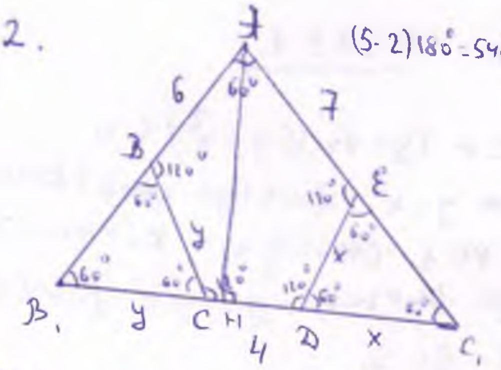
Tomoni 11x Δ lar $(2+1)\,2$

Tomoni 12x Δ lar 2

$S=(57+52+45+36+28+21+15+10+6+3+1)\,2=274\cdot 2=548$

$S_{umum}=548+120=668$ Javob: 668 ta

N2.



$(5-2)180^\circ=540^\circ$ $\angle B=\angle C=\angle D=\angle E=\dfrac{540^\circ-60^\circ}{4}=120^\circ$

AB va AE tomonlarni davom ettiramiz CD tögri chiziq bilan kesishguncha.

Bunda ΔAB_1C_1 muntazam

ΔBCB_1 va ΔEDC_1 ham muntazam

$ED=x$ $BC=y$ bölsa

$AB_1=6+y$

$AC_1=7+x$

$B_1C_1=B_1C+CD+DC_1=4+x+y$

ΔAB_1C_1 muntazamligidan

$4+x+y=6+y$ $\quad$ $4+x+y=7+x$

$x=2$ $\quad$ $y=3$

$\Rightarrow AB_1=B_1C_1=AC_1=9$

A dan CD ga balandlik ötkazamiz.

$AH=\sqrt{AC_1^2-HC_1^2}=\sqrt{AC_1^2-\left(\frac{B_1C_1}{2}\right)^2}=\sqrt{9^2-\frac{9^2}{4}}=\frac{9\sqrt3}{2}$ Javob: $\frac{9\sqrt3}{2}$

N4. N nafar bolaning barchasi har xil sonda sovga bergan bölsa, bolalar orasida eng köpi bilan (N-1) ta sovga berish mumkin.

1 . . . N-1 gacha (N-1) ta son Demak 1ta bola umuman sovga bermagan.

Berilgan sovg'alar soni $0+1+2+\dots+(N-1)=\frac{N(N-1)}{2}$ ta

Har bir bola ~~da~~ k tadan sovg'a olgan bo'lsa

$N\cdot k=\frac{N(N-1)}{2}$ $\quad N=2k+1 \quad \underline{N>1} \quad \underline{k\in N}$

0 ta, 1 ta, 2 ta, ... $2k$ ta sovg'a bergan bolalar tartibida joylashtirsak

$x_1 \quad x_2 \quad \dots \quad x_{2k} \quad x_{2k+1}$

$a_{2k+1} \to x_{2k+1}$ bola bergan sovg'a

$a_{2k+1} \quad a_{2k+1} \quad \dots \quad a_{2k+1} \quad a_2$

$a_{2k} \quad a_{2k} \quad \dots \quad a_{2k} \quad a_3 \quad a_3$

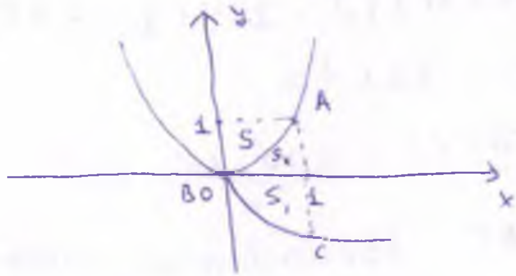
$a_{2k-1} \quad a_{2k-1} \quad \dots \quad a_{2k-1} \quad a_4 \quad a_4 \quad a_4$

$\dots$

Javob: $N=2k+1 \quad k\in N$

$\underbrace{a_{k+2} \quad a_{k+2} \quad \dots \quad a_{k+2}}_{k+1 \text{ ta}} \quad \underbrace{a_{k+1} \quad a_{k+1} \dots a_{k+1}}_{k \text{ ta}}$

N3



$(y+\sqrt{x})(y-x^2)\sqrt{1-x}\le 0$

$x\ge 0$

$1-x\ge 0 \quad \underline{0\le x\le 1}$

$x\le 1$

$\sqrt{1-x}\ge 0 \quad (y+\sqrt{x})(y-x^2)\le 0$

$y=-\sqrt{x}$ va $y=x^2$ funksiya grafiklarini chizamiz $0\le x\le 1$ oraliqni ko'ramiz.

$y=x^2$ funksiya grafigini 90° ga o'ngga bursak $y=-\sqrt{x}$ funksiya grafigi ustiga tushib qoladi. $\Rightarrow S=S_1$

$\Rightarrow ABC$ egri chiziqli Δ yuzi $S_1+S_x=S+S_x=1\cdot 1=1$

Javob: 1

N5. $n\in N$ $\quad m^3=n^3+13n-273$

$m\in N$

$(n+1)^3=n^3+3n^2+3n+1>n^3+13n-273=m^3$

Chunki $3n^2+10n+274>0$

$\underline{D<0} \Rightarrow 3n^2+10n+274>0$

Demak $m=n \quad n^3=n^3+13n-273 \quad n=21$

$n<21$ ni ko'ramiz. $\quad n\le 5 \quad n^3+13n-273<0 \quad m\in N \Rightarrow n>5$

$n=6 \quad m^3=21 \quad m\notin N$

$n=7 \quad m^3=161 \quad m\notin N$

$n=8 \quad m^3=343 \quad m=7$

$(n-1)^3<n^3+13n-273$

$-3n^2+3n-1<13n-273$

$0<3n^2+10n-272 \quad n\ge 8$ da $(n-1)^3<m^3 \Rightarrow S_n=21+8=29$

Javob: 29