2017-2018 оқу жылы

11 сынып

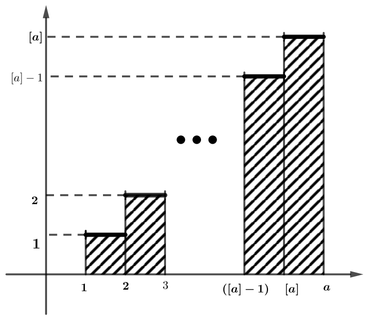
11.1. Интегралдың анықтамасы бойынша $S = \int_0^a [x]\,dx$ болсын. Онда $S = 1 + 2 + ... + ([a] - 1) + [a] \cdot (a - [a]) = \frac{[a-1] \cdot [a]}{2} + [a] \cdot (a - [a])$.

$$S = 2017 \Rightarrow \frac{[a-1] \cdot [a]}{2} < S < \frac{[a] \cdot [a+1]}{2}, \text{ өйткені } a - [a] < 1.$$

$$2016 < S < 2018 \Rightarrow [a] = 64.$$

Онда $S = 2016 + 64\,(a - 64) = 2017 \Rightarrow a = 64\frac{1}{64}$.

Жауабы: $a = 64\frac{1}{64}$.



11.2. $2f\,(x+1) - g\,(3-x) = 2x^2 + 11x - 4 \overset{x \to -t+2}{\Rightarrow} 2f\,(-t+2+1)\, g\,(3-(-t+2)) = 2\,(-t+2)^2 + 11\,(-t+2) - 4$

$$2f\,(3-t) - g\,(t+1) = 2t^2 - 19t + 26 \overset{t \Rightarrow x}{\Rightarrow} \begin{cases} 2f\,(3-x) - g\,(x+1) = 2x^2 - 19x + 26 & (1) \\ f\,(3-x) + g\,(x+1) = x^2 - 5x + 19 & (2) \end{cases}$$

$$(1) + (2) \Rightarrow 3f\,(3-x) = 3x^2 - 24x + 45 \Rightarrow f\,(3-x) = x^2 - 8x + 15 \qquad (3)$$

$$(2) \Rightarrow x^2 - 8x + 15 + g\,(x+1) = x^2 - 5x + 19.$$

$$g\,(x) = 3x + 4$$

$$(3) \overset{x=t+1}{\Rightarrow} f\,(3-(t+1)) = (t+1)^2 - 8\,(t+1) + 15.$$

$$f\,(2-t) = t^2 - 6t + 8 \overset{t \Rightarrow x}{\Rightarrow} f\,(2-x) = x^2 - 6x + 8.$$

$$f\,(2-x) = g\,(x+1) \Rightarrow x^2 - 6x + 8 = 3x + 4 \Rightarrow x = \frac{9 \pm \sqrt{65}}{2}.$$

Жауабы: $x = \frac{9 \pm \sqrt{65}}{2}$.