1.14 $\sum_{k=1}^{n} \frac{1}{k^2} \leq 2 - \frac{1}{n}$

A_1: $\frac{1}{1^2} \leq 2 - \frac{1}{1}$ $\boxed{+}$

$1 \leq 1$

A_{n+1}: $\sum_{k=1}^{n+1} \frac{1}{k^2} \leq 2 - \frac{1}{n+1}$ – ?

$\sum_{k=1}^{n} \frac{1}{k^2} \leq 2 - \frac{1}{n} \Rightarrow \boxed{\sum_{k=1}^{n} + \frac{1}{n} \leq 2}$

$\sum_{k=1}^{n+1} \frac{1}{k^2} = \sum_{k=1}^{n} \frac{1}{k^2} + \frac{1}{(n+1)^2}$

$\sum_{k=1}^{n} \frac{1}{k^2} + \frac{1}{(n+1)^2} + \frac{1}{n+1} \leq 2$

$\boxed{\sum_{k=1}^{n} \frac{1}{k^2} + \frac{2+n}{(n+1)^2} \leq 2}$

$\frac{1}{n} - \frac{2+n}{(n+1)^2} = \frac{n^2+2n+1-2-n}{n(n+1)^2} = \frac{n^2+n-1}{n(n+1)^2} > 0 \Rightarrow$

$\Rightarrow \sum_{k=1}^{n+1} \frac{1}{k^2} \leq 2 - \frac{1}{n+1}$

1.15 $n^n \geq (2n-1)!!$

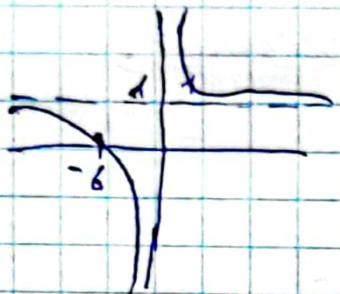
A_1: $1^1 \geq (2-1)!!$ $1 \geq 1$

A_{n+1}: $(n+1)^{n+1} \geq (2n+1)!!$

$$\frac{(n+1)^{n+1}\cdot n^n}{n^n} > \frac{(n+1)^{n+1}\cdot(2n-1)!!}{n^n} =$$

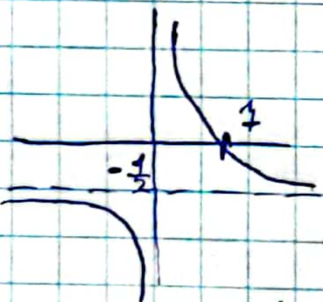
$$= \frac{(n+1)^{n+1}\cdot(2n+1)!!}{n^n\cdot(2n+1)} = \frac{(n+1)^n\cdot(n+1)\cdot(2n+1)!!}{n^n\cdot(2n+1)} \geq (2n+1)!!$$

2.1 $y = \frac{6+x}{x} = 1 + \frac{6}{x}$



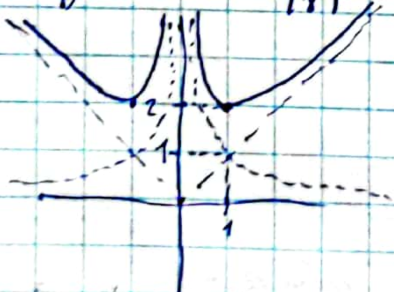
$\frac{6+x}{x} = 0 \Rightarrow x = -6$

2.2 $y = \frac{4-x}{2x} = -\frac{1}{2} + \frac{4}{2x}$

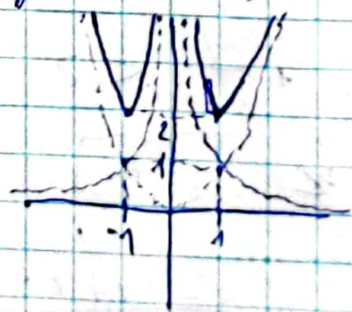


$\frac{4-x}{2x} = 0 \Rightarrow x = 4$

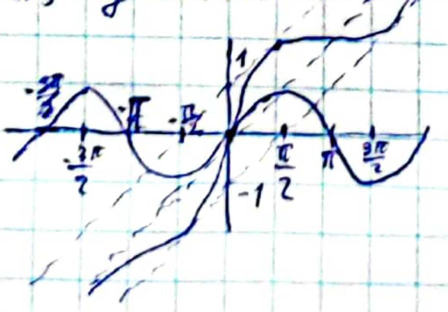
2.3 $y = |x| + \frac{1}{|x|}$



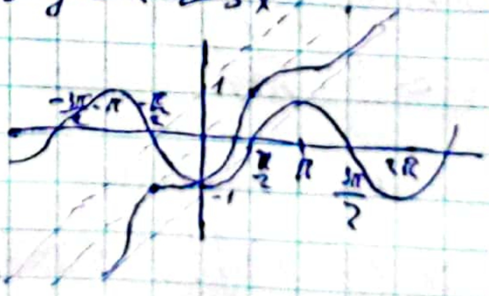
2.4 $y = x^2 + \frac{1}{|x|}$



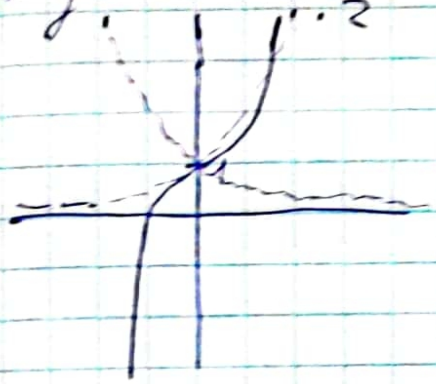
2.5 $y = x + \sin x$



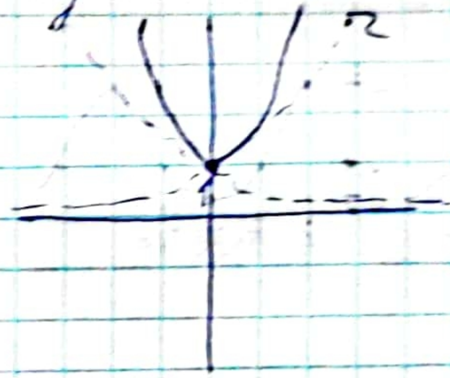
2.6 $y = x - \cos x$



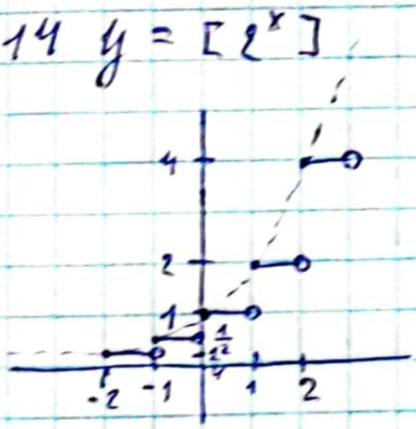
2.7 $y = sh\, x = \frac{e^x - e^{-x}}{2}$



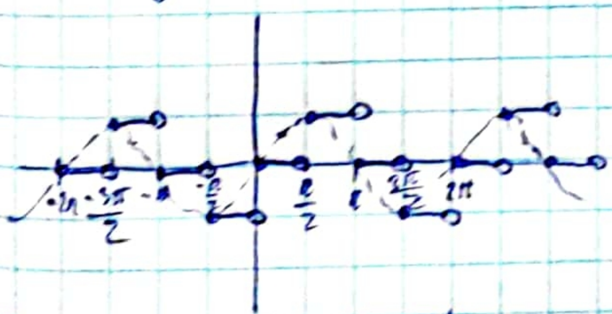
2.8 $y = sh\, x = \frac{e^x + e^{-x}}{2}$



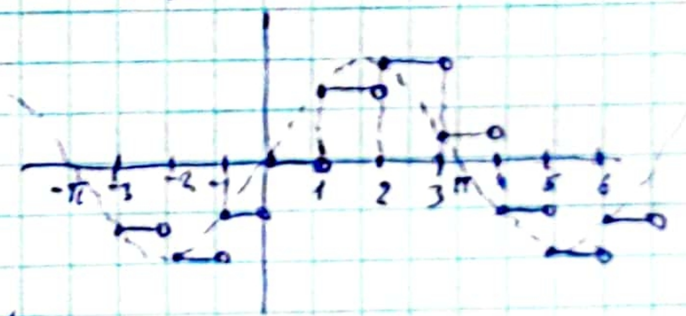
2.14 $y = [2^x]$



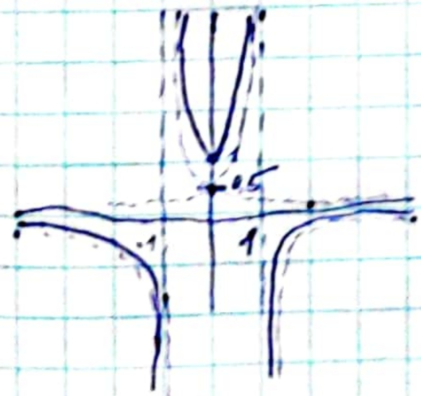
2.15 $y = [\sin x]$



2.17 $y = \sin[x]$



2.20 $y = \frac{1}{1-x^2} = \frac{1}{2+2x} + \frac{1}{2+2x}$



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2.25 $y = e^{\sin x}$