AUC apCalculus BC

ClassWork 01

PROBLEM 6.1. *For each of the following functions limit statements write and prove the limit statement by the rigorous definition of limits:*
Let us consider the following algebraic equivalence:

LEMMA 6.1. *(lemma's nickname: a nice inequality) For any real number y,*

$$\frac{1}{2} < y < \frac{3}{2} \iff |y - 1| < \frac{1}{2}$$

PROOF. Give the proof.   □

Factor the highest monomial of n and use the lemma:

(1) $\lim\limits_{n \to +\infty} n^8 - 3n^5 = +\infty.$

(2) $\lim\limits_{n \to +\infty} n^8 + 3n^5 - 2n^3 = +\infty.$

PROBLEM 6.2. *Prove that eventually on n,*

(1) $\left|\frac{\sin(n)}{n^3 - n^2 - 10}\right| < 1/2013.$

(2) $-n^2 + n^3 > 10^{20}.$

PROBLEM 6.3. *Prove that* $\frac{1}{\pm\infty} = 0.$