Name _____   **Problem Set 1**

"A useful resource that prepares you for the AP test is the problem sets. Now, I know that this can be difficult and dreadful for many of you, but this is seriously amazing for preparation for the AP test because it slowly gets you used to how the AP test fees. By doing these problem sets and taking them seriously, the AP test felt more comfortable" A 2019 Nerd
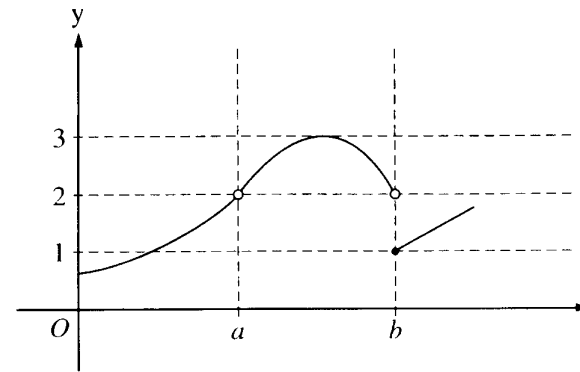
FR1.   1981 – AB 1 **(No Calculator)**

Let $f(x)$ be the function defined by $f(x) = x^4 - 4x^2 + 3$.

a) Find the zeros of $f(x)$.
b) Write an equation of the tangent line to the graph of $f(x)$ at the point where $x = 1$.
c) Find the interval(s) in which $f(x)$ is increasing. Justify your answer.

MC1. The graph of the function f is shown in the figure above. Which of the following statements about f is true?

(A) $\lim\limits_{x \to a} f(x) = \lim\limits_{x \to b} f(x)$

(B) $\lim\limits_{x \to a} f(x) = 2$

(C) $\lim\limits_{x \to b} f(x) = 1$

(D) $\lim\limits_{x \to a} f(x)$ does not exist.

MC2. Find the limit: $\lim\limits_{h \to 0} \dfrac{(x+h)^2 + 3(x+h) - (x^2 + 3x)}{h}$

(A) $2x + 3$ (B) 3   (C) $x^2 + 3$ (D) DNE

MC3. Find the limit: $\lim\limits_{x \to 2} \dfrac{x-2}{x^2 - x - 2}$

(A) 0   (B) $\dfrac{1}{3}$ (C) 1   (D) DNE