

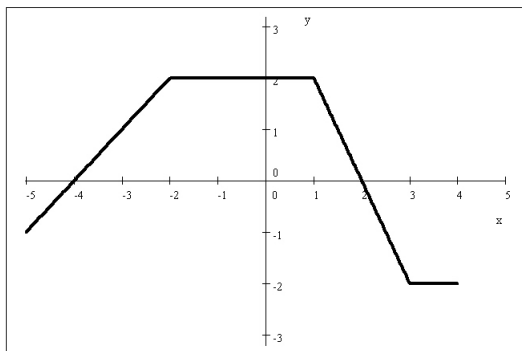
2017 Calculus Bee
Wednesday, April 26, 2016

1st Place	Think Doan
2nd Place	Clark Mask
3rd Place	Bao Thach

(1) Find the derivative of the function $g(p) = p\sqrt{2017 - p}$.

(2) Find $\lim_{x \rightarrow \infty} \frac{2017x - x^{2017}}{x^{2017} + 2017x}$.

(3) Below is the graph of $y = \frac{dF}{dx}$.



(a) Find $F''(2)$.

(b) If $F(-1) = 2017$, find $F(4)$.

(4) Find the maximum value of the function $F(x) = x(2017 - x)$.

(5) Put the following quantities in increasing order.

(A) $\int_{-\pi}^{\pi} \sin^4(x^6) dx$.

(B) $\int_{-\pi}^{\pi} \sin^6(x^6) dx$.

(C) $\int_{-\pi}^{\pi} e^{x^2} \sin^4(x^6) dx$.

(D) $\int_{-\pi}^{\pi} \sin^{2017}(x^{2017}) dx$.

(6) Find the approximate value of $\sum_{k=1}^{2017} \frac{2017}{3^k}$, accurate to within 0.01.

(7) Evaluate

$$\int \frac{\ln x}{x} dx.$$