Day 2 Wrap up Questions

Name

gap

1. The function g is defined by $g(x) = \frac{|x-5|}{x-5}\ln\left(\frac{x+5}{x^2}\right)$. At what values of x does the graph of g have a vertical asymptote?

x=-5 ln(0) is asymptote

x=0 $\frac{x+5}{x^2}$ has asymptote

(A) $x = -5$ only

(B) $x = 0$ only

(C) $x = -5$ and $x = 0$ only

(D) $x = -5$, $x = 0$, and $x = 5$

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2. Let g and h be the functions defined by $g(x) = -2x^2 + 4x + 1$ and $h(x) = \frac{1}{2}x^2 - x + \frac{11}{2}$. If f is a function that satisfies $g(x) \le f(x) \le h(x)$ for all x, what is $\lim_{x\to 1} f(x)$?

$\lim_{x\to 1} g(x) = 3$ $\lim_{x\to 1} h(x) = 5$

doesn't squeeze f

(A) 3

(B) 4

(C) 5

(D) The limit cannot be determined from the information given.

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3. Let f, g, and h be the functions defined by $f(x) = \frac{\sin x}{2x}$, $g(x) = x^4\cos\left(\frac{1}{x^2}\right)$, and $h(x) = \frac{x^2}{\tan x}$ for $x \neq 0$. All of the following inequalities are true on the interval $[-1, 1]$ for $x \neq 0$. Which of the inequalities can be used with the squeeze theorem to find the limit of the function as x approaches 0 ?

1. $\frac{1}{4} \le f(x) \le x^2 + \frac{1}{2}$
2. $-x^4 \le g(x) \le x^4$
3. $-\frac{1}{x^2} \le h(x) \le \frac{1}{x^2}$

1/4 ← 1/2 x

-∞ +∞ x 2 could work

only #2 squeezes its function

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(A) I only

(B) II only

(C) I and III only

(D) II and III only

$e^{-\infty}$ $\frac{1}{e^{\infty}} \to 0$

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4. Let f be the function given by $f(x) = \frac{(\cos x)e^{2x}-1}{e^{2x-1}+2}$. What are all horizontal asymptotes to the graph of f ?

(A) $y = -\frac{1}{2}$ only

(B) $y = e$ only

(C) $y = -\frac{1}{2}$ and $y = e$

(D) The graph of f has no horizontal asymptotes.

as $x \to \infty$ $\frac{\cos x \cdot e^{2x}}{e^{2x}} \cdot e \to$ no asymptote

as $x \to -\infty$ $\frac{\cos x \cdot (0) - 1}{0 + 2} = -\frac{1}{2}$

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5. Let f be the function defined by $f(x) = \frac{2-x+3x^2+5x^3-7x^4}{x^4-2x^3-5x^2+2x-3}$ for $x > 0$. Which of the following is a horizontal asymptote to the graph of f ?

(A) $y = -7$

(B) $y = 2$

(C) $y = 7$

(D) There is no horizontal asymptote to the graph of f.

$f(x) \to \frac{-7x^4}{x^4} = -7$

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6. Let f be the function defined by $f(x) = \frac{2^x+5}{e^x+1}$ for $x > 0$. Which of the following is a horizontal asymptote to the graph of f ?

(A) $y = 0$

(B) $y = \frac{2}{e}$

(C) $y = 1$

(D) There is no horizontal asymptote to the graph of f.

$\lim_{x\to\infty} \frac{2^x+5}{e^x+1} \to \frac{2^x}{e^x} = \left(\frac{2}{e}\right)^x \to 0$ as $x \to \infty$