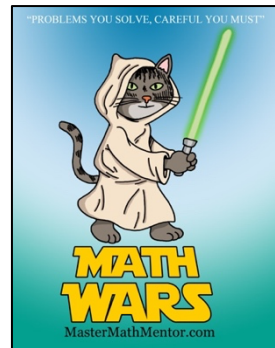


Math Wars – BC Calculus

Topic 203 – Integration w/Partial Fractions



Maximum Time: 8 Minutes

Directions: To start, you need to download the Math Wars application on your cell phone: Use the QR code or the url:

<https://mastermathmentor.com/mmm/mathwars.ashx?key=203>

When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing **Submit** for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based on how many problems you got right and your time. A perfect score is all problems correct using half the maximum time or less. You can text or email your friends with your results.

1. (1 pt) Which of the following is a proper partial fraction decomposition?

I. $\frac{1}{x^2+16x} = \frac{A}{x} + \frac{B}{x+16}$

II. $\frac{1}{x^2+16x+64} = \frac{A}{x+8} + \frac{B}{x+8}$

III. $\frac{1}{x^3-16x} = \frac{A}{x} + \frac{B}{x+8} + \frac{C}{x-8}$

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

2. (3 pts) The partial fraction decomposition of $\frac{2a}{x^3-x}$ is

A. $\frac{a}{x+1} + \frac{a}{x-1} + \frac{2a}{x}$

B. $\frac{a}{x+1} + \frac{a}{x-1} - \frac{2a}{x}$

C. $\frac{2a}{x} - \frac{a}{x+1} - \frac{a}{x-1}$

D. $\frac{2a}{x} + \frac{a}{x+1} - \frac{a}{x-1}$

3. (5 pts) $\int \frac{2x-12}{x^2+4x-12} dx =$

A. $\ln\left[|x-2|^3|x+6|\right] + C$

B. $\ln\left[\frac{|x-2|^3}{|x+6|}\right] + C$

C. $\ln\left[|x+6|^3|x-2|\right] + C$

D. $\ln\left[\frac{|x+6|^3}{|x-2|}\right] + C$

4. (7 pts) $\int \frac{x^2+1}{x^2-1} dx =$

A. $1 + \ln\left|\frac{x+1}{x-1}\right| + C$

B. $1 + \ln\left|\frac{x-1}{x+1}\right| + C$

C. $x + \ln\left|\frac{x-1}{x+1}\right| + C$

D. $x - \ln\left|\frac{x-1}{x+1}\right| + C$

5. (9 pts) The area bounded by $y = \sqrt{\frac{2}{x^2 + 2x}}$, the x -axis, and the lines $x = 1$ and $x = 4$ is the base of a solid whose cross-sections perpendicular to the x -axis are squares. Find the volume of the solid.

A. $\ln 2$

B. $\ln 3$

C. $\ln 3 - \ln 2$

D. $\ln 3 + \ln 2$