

# Math Wars – BC Calculus

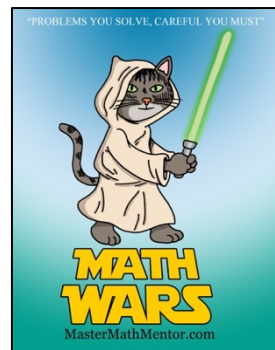
## Topic 204 – Improper Integrals



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=204>



When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing  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) How many the following integrals are convergent?

I.  $\int_2^{\infty} \frac{1}{x-1} dx$

II.  $\int_2^{\infty} \frac{1}{(x-1)^2} dx$

III.  $\int_2^{\infty} \frac{1}{\sqrt{x-1}} dx$

A. 3

B. 2

C. 1

D. 0

2. (3 pts)  $\int_0^a \frac{1}{\sqrt{a-x}} dx =$

A. divergent

B.  $\frac{2}{\sqrt{a}}$

C.  $\frac{\sqrt{a}}{2}$

D.  $2\sqrt{a}$

3. (5 pts)  $\int_0^{\infty} \frac{e^x}{(2+2e^x)^2} dx =$

A.  $\frac{1}{8}$

B.  $\frac{1}{4}$

C.  $\frac{1}{2}$

D. divergent

4. (7 pts)  $\int_3^6 \frac{1}{(x-4)^3} dx =$

A. 1

B.  $\frac{3}{4}$

C.  $\frac{1}{4}$

D. divergent

5. (9 pts) The unbounded on the right shaded region as shown in the figure to the right is rotated about the  $x$ -axis. Find the volume of the solid.

A.  $\pi \ln 3$

B.  $2\pi \ln 3$

C.  $\pi \ln \frac{3}{2}$

D.  $\pi \ln 2$

