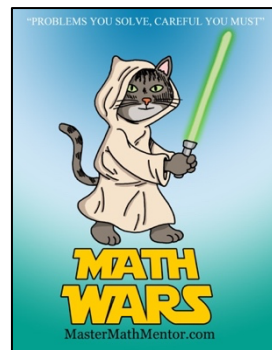


# Math Wars – BC Calculus

## Topic 202 – Integration by Parts



**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=202>

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)  $\int \ln x \cdot e^x dx$  can be written

A.  $\ln x \cdot e^x - \int \frac{e^x}{x} dx$

B.  $\frac{e^x}{x} - \int \frac{e^x}{x} dx$

C.  $\ln x - \int \frac{e^x}{x} dx$

D.  $e^x - \int \frac{\ln x}{x} dx$

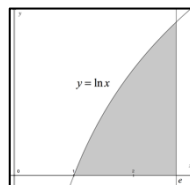
2. (3 pts) Find the area of the shaded region.

A. 1

B.  $e$

C.  $e + 1$

D.  $e - 1$



3. (5 pts)  $\int \sin x \cos x dx$  is to be found.  $U$ -substitution and integration by parts are attempted. Which methods can be used?

A. Both methods

B. Only  $u$ -substitution

C. Only integration by parts

D. Neither

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

A.  $x \tan^{-1} x - \frac{1}{2} \ln(1 - x^2) + C$

B.  $x \tan^{-1} x - 2 \ln(1 - x^2) + C$

C.  $x \tan^{-1} x - \frac{1}{2} \ln(1 + x^2) + C$

D.  $x \tan^{-1} x - 2 \ln(1 + x^2) + C$

5. (9 pts) The function  $f$  is differentiable and its derivative is continuous. The table below give the value of  $f$  for  $x = -2, 0, 2,$  and  $4$ . Find the approximate value of  $\int_{-2}^4 x f'(x) dx$  using a trapezoidal rule with 4 trapezoids.

$x$	$f(x)$
-2	5
0	3
2	-1
4	2

A. 14

B. 7

C. -2

D. -12