Instructions: This is your second quiz. Choose the *single best answer* from the list of options. Please fill in

- Your User ID
- Your Name
- Your Section
- Your UIN number.

The User ID is *the most important identifier* as this is how Compass identifies students (not by first and last name, which are often not unique). If you don't include your user ID your score will probably not be recorded correctly.

Double your money back guarantee! If your answer is scored wrong and you can demonstrate that the integral can be done successfully using your method you get a two point bonus

Problem 1: If you were to attempt to do the following integral

$$I = \int x^2 \sin(2x) dx$$

via integration by parts, how would you choose the parts?

a $u = \cos(2x) \quad dv = 2xdx$

b $u = x\sin(2x) \quad dv = xdx$

c $u = x^2 \quad dv = \sin(2x)dx$

d $u = \sin(2x) \quad dv = x^2 dx$

e $u = x^2 \sin(2x) \quad dv = dx$

Problem 2: Compute the following integral

$$I = \int x^2 \sin(2x) dx$$

a $I = -\frac{x^2}{2}\cos(2x) - \frac{x}{4}\sin(2x) + \frac{1}{4}\cos(2x) + C$

b $I = -\frac{x^2}{2}\cos(2x) + \frac{x}{4}\sin(2x) + \frac{1}{4}\cos(2x) + C$

c $I = -\frac{x^2}{2}\cos(2x) + \frac{x}{2}\sin(2x) + \frac{1}{4}\cos(2x) + C$

d $I = -\frac{x^2}{2}\sin(2x) + \frac{x}{2}\cos(2x) + \frac{1}{4}\sin(2x) + C$

e $I = -\frac{x^2}{2}\sin(2x) + \frac{x}{2}\sin(2x) + \frac{1}{4}\cos(2x) + C$

Problem 3: If you were to attempt to do the following integral

$$I = \int (\ln|x|)^2 dx$$

via integration by parts, how would you choose the parts?

a $u = (\ln|x|)^2 \quad dv = dx$

b $u = x \quad dv = \frac{(\ln|x|)^2}{x} dx$

c $u = \ln(x) \quad dv = \ln|x| dx$

d $u = 1 \quad dv = (\ln|x|)^2 dx$

e $u = 2\ln|x| \quad dv = dx$

Problem 4: Evaluate the integral

$$I = \int (\ln|x|)^2 dx$$

a $I = x(\ln(x))^2 - 2x\ln|x| + 2x + C$

b $I = x(\ln(x))^2 + 2x\ln|x| - x + C$

c $I = x(\ln(x))^2 - x\ln|x| + 2x + C$

d $I = x(\ln(x))^2 + 2x\ln|x| + 2x + C$

e $I = x(\ln(x))^2 - 4x\ln|x| + 4x + C$

Problem 5: For which of the integrals below is integration by parts **least likely** to prove useful:

a $I = \int \arcsin(x)dx$

b $I = \int x\ln(x)dx$

c $I = \sin(x)e^{\cos(x)}dx$

d $I = \int \arctan(x)dx$

e $I = \int \cos(x)e^{2x}dx$

Problem 6: Evaluate the integral

$$I = \int x^3 e^{x^2} dx$$

using a combination of techniques.

a $I = e^{x^2} + C$

b $I = \frac{x^4 e^{x^2}}{4} + C$

c $I = \frac{(x^2-1)e^{x^2}}{2} + C$

d $I = \frac{x^3 e^{x^2}}{2x} + C$

e $I = \frac{(x^3-x)e^{x^2}}{2} + C$