MA 16020

Instructions. Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (4 points) Compute

$$\int \cos(7x) e^{\sin 7x} \, dx.$$

Solution. Here we want to pick $u = \sin 7x$, which gives

$$du = 7\cos 7x \, dx$$
$$\frac{1}{7} \, du = \cos 7x \, dx.$$

Now the problem at hand is

$$\frac{1}{7} \int e^u du = \frac{1}{7} e^u + C$$
$$= \frac{1}{7} e^{\sin 7x} + C \qquad \Box$$

Common issues. The most common mistake on this problem was forgetting the chain rule when differentiating $\sin 7x$. Also don't forget the +C!

Problem 2. (4 points) Evaluate

$$\int_0^\pi x \, dx$$

Solution.

$$\int_{0}^{\pi} x \, dx = \left. \frac{1}{2} x^{2} \right|_{0}^{\pi}$$
$$= \frac{1}{2} \left(\pi^{2} - 0 \right)$$
$$= \frac{\pi^{2}}{2}$$

Common issues. Many people made the substitution u = x. Recall that this doesn't do anything besides change the letter in the integral to u.

Problem 3. (2 points) How many seasons of the Great British Baking Show have you seen?

Solution. All 4 is the correct answer. If your answer is less than 4, you should definitely get on that. $\hfill \Box$