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

$$\begin{aligned} du &= 7\cos 7x\, dx \\ \frac{1}{7}\, du &= \cos 7x\, dx. \end{aligned}$$

Now the problem at hand is

$$\begin{aligned} \frac{1}{7}\int e^u\, du &= \frac{1}{7}e^u + C \\ &= \frac{1}{7}e^{\sin 7x} + C \end{aligned}$$

□

Problem 2. (4 points) Evaluate

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

Solution.

$$\begin{aligned} \int_0^\pi x\, dx &= \frac{1}{2}x^2\Big|_0^\pi \\ &= \frac{1}{2}\left(\pi^2 - 0\right) \\ &= \frac{\pi^2}{2} \end{aligned}$$

□

Problem 3. (2 points) Do we have class on Monday (16 January)?

Solution. No. □