MATH 202, Spring 2024 | **Name:** ____________________

In class work 4 | **Row and Seat**: ____________________

In class work **4** has questions **1** through **4** with a total of **6** points. Turn in your work at the end of class *on paper*. This assignment is due *Tuesday 6 February 13:20*.

$\boxed{1}$ 1. My friend Morwenna claims that $\int_{-9}^{9} x\sqrt{1+x^2}\,\mathrm{d}x = 0$, but she doesn't know why this is true. Explain to Morwenna why it is true that $\int_{-9}^{9} x\sqrt{1+x^2}\,\mathrm{d}x = 0$.

$\boxed{1}$ 2. My friend Louisa claims that because the interval -9 to 9 is symmetric with respect to the origin, that $\int_{-9}^{9}(x^2 - x)\,\mathrm{d}x = 0$. Explain to Louisa what condition she is missing.

$\boxed{1}$ 3. My friend Mr. Bert Frogmore is having difficulty evaluating the integral $\int_{-1}^{1}\sqrt{1-x^2}\,\mathrm{d}x$. Show Mr. Frogmore an easy (and I mean easy) way of finding the numerical value of this definite integral.

4. For the region of the xy plane $Q = \{(x, y)|0 \leq y \leq 2 - x, \text{ and } 0 \leq x \leq 2\}$, do the following

   (a) Sketch the region Q.

$\boxed{1}$ (b) Find the *area* of Q.

$\boxed{1}$ (c) Find the x-coordinate of the centroid of Q.

$\boxed{1}$ (d) Find the y-coordinate of the centroid of Q.