

In class work 13 has questions 1 through 6 with a total of 6 points.

“Great things are not accomplished by those who yield to trends and fads and popular opinion.”

JACK KEROUAC

Here is a copy of Larry’s top secret short table of obscure integrals (STOI)

$$\int |x| \, dx = \frac{x |x|}{2},$$

$$\int x |x| \, dx = \frac{x^2 |x|}{3},$$

$$\int x^2 |x| \, dx = \frac{x^3 |x|}{4},$$

$$\int [x] \, dx = -\frac{1}{2} [x] ([x] - 2x + 1).$$

1. Use seventh grade geometry to find the numerical value of $\int_{-2}^3 |z| \, dz$.

2. Use the STOI to find the numerical value of $\int_{-2}^3 |z| \, dz$.

1 3. Use seventh grade geometry to find the numerical value of $\int_1^5 \lfloor z \rfloor dz$.

1 4. Use the STOI to find the numerical value of $\int_1^5 \lfloor z \rfloor dz$.

- 1 5. According to the STOI, we have $\int \lfloor x \rfloor dx = -\frac{1}{2} \lfloor x \rfloor (\lfloor x \rfloor - 2x + 1)$. Ask Desmos to graph $y = -\frac{1}{2} \lfloor x \rfloor (\lfloor x \rfloor - 2x + 1)$. Draw the graph here. Does the graph appear to be continuous?

- 1 6. Use the STOI to find the numerical value of $\int_0^\pi 2 \left\lfloor \frac{x}{2} \right\rfloor dx$. **Hint:** Substitute $z = x/2$.