

Written homework #2

Please **show all your work**. Submit on September 29 in class.

(1) Figure out whether the following integrals converge or diverge, and, if they converge, find their value (i.e. integrate).

(a)

$$\int_{-2}^3 \ln(|x|) dx$$

(b)

$$\int_1^7 \frac{1}{(x-3)^2} dx.$$

Hints for part (a):

(A) $|x|$ equals to x , for all $x > 0$, and $|x|$ equals to $-x$ for all $x < 0$

(B) $\lim_{x \rightarrow 0} x \ln x = 0$.

(2) Region R is bounded by lines $y = \sqrt{x}$ and $y = x$. A solid is obtained by rotating region R about line $x = -1$. Express the volume of this solid in the form of an integral. Make a nice drawing and show all your work. **Do not** evaluate the integral.