Please show all your work, don’t just write down the final number.

- Reading: Chapter 6.2.1-6.2.3, 7, 11.1-11.2
- Exercises 6.2.3, 7.1.1, 7.1.4, 7.1.8, 7.2.4, 7.2.9, 7.2.10, 11.1.5
- Ross (8th edition, problems should match the 7th edition)

5.37 If $X$ is uniformly distributed over $(-1,1)$, find
(a) $P(\mid X \mid > \frac{1}{2})$;
(b) the density function of the random variable $\mid X \mid$.

5.39 If $X$ is an exponential random variable with parameter $\lambda = 1$, compute the probability density function of the random variable $Y$ defined by $Y = lnX$.

6.21 Let
$$f_{XY}(x,y) = 24xy \quad 0 \leq x \leq 1, \ 0 \leq y \leq 1, \ 0 \leq x + y \leq 1$$

and let it equal to 0 otherwise.
(a) Show that $f_{XY}(x,y)$ is a joint probability density function
(b) Find $E[X]$.
(c) Find $E[Y]$.