HW 8

Group 1 **Grade:**

If X is uniformly distributed over (a, b), $a < b$, what is the probability density function of $Y = cX + d$ for any constants c and d.

Group 2 **Grade:**

A die is biased in such a way that even numbers are three times as likely to be rolled as odd numbers. Approximate the probability that the number 5 will appear at most 15 times in 100 throws.

Group 3 **Grade:**

If Y has an exponential distribution with mean $\frac{1}{\lambda}$, find (as a function of λ) the median of Y.

Group 4 **Grade:**

The random variable X has probability density function

$$f_X(x) = \begin{cases} cx & 0 \le x \le 2 \\ 0 & \text{otherwise} \end{cases}$$

1. What is the constant c to make the f_X a valid PDF? The result will be used in the following questions.
2. Find the CDF of X.
3. Find $\mathbb{E}[X]$ and $\text{Var}[X]$.

The CDF of random variable Y is

$$F_Y(y) = \begin{cases} 0 & y < -1 \\ (x+1)/2 & -1 \le y < 1 \\ 1 & y \ge 1 \end{cases}$$

1. Find the PDF of Y.
2. Find $\mathbb{E}[Y]$ and $\text{Var}[Y]$.

Group 5 **Grade:**

X is a uniform random variable with expected value $\mu_X = 7$ and variance $\text{Var}[X] = 3$. What is the PDF of X?