HW 4 Colin Wishart

1. X dist. in $-5 \le x \le 5$

$$F_x(x) = \frac{1}{b-a} = \frac{1}{5-(-5)} = \frac{1}{10}, \text{ if } -5 \le x \le 5$$

a. $P(x<1) = \int_{-5}^{1} \frac{1}{10}\,dx = \frac{1}{10}x\Big|_{-5}^{1}$

$$= \frac{1}{10}(1-(-5)) = \frac{6}{10}$$

$|x-1| \neq 0$

b. $P(|X-1| \ge 1) = P(X \le 0) + P(X \ge 2)$

$$= \int_{-5}^{0} \frac{1}{10}\,dx + \int_{2}^{5} \frac{1}{10}\,dx$$

$$= \frac{1}{10}x\Big|_{-5}^{0} + \frac{1}{10}x\Big|_{2}^{5} = \frac{5}{10} + \frac{1}{10}(5-2)$$

$$= \frac{5}{10} + \frac{3}{10} = \frac{8}{10}$$

2. $\bar{x} = 5 \quad \lambda = \frac{1}{\bar{x}} = \frac{1}{5}$

$$P(x>8 \mid x>3) = \frac{P(x>8)}{P(x>3)}$$

$$= \frac{e^{-(\frac{1}{5})(8)}}{e^{-(\frac{1}{5})(3)}} = 0.3679$$