

- Don Arishi

- Final Exam

(33) false = not the same mean nor variance

so, they don't have the same distribution

(31) mean = $\sum_{i=1}^n \frac{x_i}{n}$

$$= \frac{100 + 90 + 82 + 85 + 83 + 80 + 70}{8}$$

$$= 85$$

$$\text{Standard Deviation} = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_i - \text{mean})^2}$$

$$= \frac{1}{8} \sqrt{(100 - 85)^2 + \dots + (70 - 85)^2}$$

$$= 8.518$$

$$\textcircled{1} = 85 - 40 = \underline{45}$$

(3) 2 month faculty member = $6C_2$

ways selecting 5 members = $13C_5$

No. ways selecting 3 non-month = $7C_3$

$$= \frac{6C_2 \times 7C_3}{13C_5}$$

$$= \frac{\begin{pmatrix} 6 \\ 2 \end{pmatrix} \begin{pmatrix} 7 \\ 3 \end{pmatrix}}{\begin{pmatrix} 13 \\ 5 \end{pmatrix}}$$

$$(27) E(XY) = \sum_{i,j} x_i y_j P(X=x_i, Y=y_j)$$

$$= 0.06 + 0.04 + 0.02 + 0.12 = \boxed{0.24}$$

$$(4) P(\text{girl}) = 0.5$$

Let X_1, X_2, X_3 each represent the first, second, third

$$P(X_1=6, X_2=6, X_3=6 | X_1=6, X_2=6)$$

$$= P(X_1=6, X_2=6, X_3=6) = P(X_1=6) \cdot P(X_2=6)$$

$$\cdot P(X_3=6) = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$$

$$P(X_1=6; P(X_3=6)) = P(X_1=6) \cdot P(X_3=6)$$

$$= \frac{1}{2} \times \frac{1}{4} = \frac{1}{4}$$

$$= \frac{\frac{1}{8}}{\frac{1}{4}} = 0.5$$

$$(5) = (0.1 \times 0.2) + (0.7 \times 0.8)$$

$$= 0.58$$

$$(6) = (0.5 \times 0.8) + (0.8 \times 0.4) = 0.62$$

$$P = \frac{0.5 \times 0.8}{0.62} = (0.484)$$

$$(7) 15 = 6 \quad 20 = 5$$

$$= 645 - 1 = \boxed{10}$$

$$(28) N=5, \sigma^2=4$$

$$P(X < 2) = P\left(Z < \frac{2-5}{\sqrt{4}}\right) = P(Z < -0.75)$$

$$= 0.2266$$

$$(26) \int_0^{\infty} \frac{1}{5} e^{-\frac{2}{5}x} = \left[-e^{-\frac{1}{3}x}\right]_0^{\infty}$$

$$= e^{-\frac{3}{5}}$$

$$(13) P(X=7) = \binom{7}{0} (0.2)^0 (1-0.2)^{7-0}$$

$$(14) \frac{1}{\frac{1}{60}} = \frac{1}{60} \times 60 \text{ sec} = 10 \text{ sec}$$

$$(16) E(X) = n \times p \Rightarrow n = \frac{E(X)}{p} = \frac{1}{0.2} = 5$$

$$(18) E(X) = P(X=1) + P(X=2) + P(X=3)$$

$$= 0.1 \times 1 + 0.1 \times 2 + 0.1 \times 3 = 0.36$$

$$(19) \text{Var}(X) = 2; \text{Var}(3X+4) = 3^2 \times \text{Var}(X)$$

$$= 9 \times 2 = 18$$

$$(20) E(X) = 0.4 \times 2 + 0.3 \times 4 + 0.2 \times 6 + 0.1 \times 8 = 4$$

$$(23) 1 - P(Z > a) = P(Z < -a)$$

$$= 1 - 2P(Z < -a) = 1 - 2 \times 0.19 = 0.62$$

$$(24) \quad f_x(4) = \int_1^4 2x^{-3} dx = 2 \left[x - \frac{1}{2x^2} \right]_1^4$$

$$= \left[\frac{1}{x^2} \right]_1^4 = \frac{15}{16}$$

(25) the mean of uniform. $\frac{1}{2} \times 1 \text{ hour} = 30 \text{ mins}$

$$(12) (0.6 \times 0.4 \times 0.4 \times 0.6) + (0.4 \times 0.6 \times 0.4 \times 0.6) + (0.4 \times 0.4 \times 0.6 \times 0.6) = 0.173$$