A1 (1) $P(x=1) = \frac{1}{2}$

$P(x=2) = \frac{1}{3}$

$P(x=3) = \frac{1}{6}$

(2) $P(x=0) = \frac{8}{27}$

$P(x=1) = \frac{4}{9}$

$P(x=2) = \frac{2}{9}$

$P(x=3) = \frac{1}{27}$

(3) $P(x=0) = \frac{3}{10}$

$P(x=1) = \frac{3}{5}$

$P(x=2) = \frac{1}{10}$

(4) $P(x=1) = \frac{2}{5}$

$P(x=2) = \frac{3}{5} \times \frac{2}{5} = \frac{6}{25}$

$P(x=3) = 1 - \frac{2}{5} - \frac{6}{25} = \frac{9}{25}$

A8.

$$F(x) = \begin{cases} 0, & x<0 \\ 0.4, & 0 \le x < 2 \\ 0.9, & 2 \le x < 3 \\ 1, & x \ge 3 \end{cases}$$

$P(1 \le x < 3) = F(3-0) - F(1-0)$

$= 0.9 - 0.4 = 0.5$

A9. $P(x=-1) = F(-1) - F(-1-0) = 0.3$

月理 $P(x=1) = 0.4$,

$\qquad P(x=3) = 0.3$

B2. (1) $P(x=0) = 0.8 = \dfrac{4}{5}$

$P(x=1) = 0.2 \times 0.8 = 0.16 = \dfrac{4}{25}$

$P(x=2) = 0.2 \times 0.2 \times 0.8 = \dfrac{4}{125}$

$P(x=4) = 0.2 \times 0.2 \times 0.2 = \dfrac{1}{125}$.

(2) $P(x>2) = \dfrac{1}{125}$.

(3) 记事件A: 总得分不低于2,

$\qquad$ B: 玩家得34分.

则 $P(B|A) = \dfrac{P(BA)}{P(A)} = \dfrac{\frac{1}{125}}{\frac{1}{125} + \frac{4}{125}} = \dfrac{1}{5}$

B6. 记X为正常元件个数

(1) $P(x=3) = C_5^3 \times 0.8^3 \times 0.2^2 = 0.2048$

(2) $P(x \geq 4) = C_5^4 \times 0.8^4 \times 0.2 + 0.8^5 = 0.7373$.

(3) $P(x \leq 2) = 0.2^5 + C_5^1 \times 0.8^1 \times 0.2^4 + C_5^2 \times 0.8^2 \times 0.2^3$

$\qquad\qquad = 0.0579$

B7. $P(x=0) = (1-P_1)(1-P_2)(1-P_3)$.

$P(x=1) = P_1(1-P_2)(1-P_3) + P_2(1-P_1)(1-P_3) + P_3(1-P_1)(1-P_2)$.

$P(x=2) = (1-P_1)P_2P_3 + (1-P_2)P_1P_3 + (1-P_3)P_1P_2$

$P(x=3) = P_1P_2P_3$.

$P(Y=0) = P_1$

$P(Y=1) = (1-P_1)P_2$

$P(Y=2) = (1-P_1)(1-P_2)P_3$

$P(Y=3) = (1-P_1)(1-P_2)(1-P_3)$.

B12. (1) 设 X 为 10:00 到 12:00 期间收到的短信数

则 $X \sim P(6)$.

$\therefore P(x=6) = e^{-6}\dfrac{6^6}{6!} = \dfrac{324}{5}e^{-6}$.

(2) 设事件 A: 收到至少 5 条短信.

        B: 恰好收到 6 条短信.

则 $P(A) = P(x \geqslant 5) = 1 - e^{-6}\left(1 + \dfrac{6^1}{1!} + \dfrac{6^2}{2!} + \dfrac{6^3}{3!} + \dfrac{6^4}{4!}\right)$

$= 1 + 115 \cdot e^{-6}$

$P(BA) = \dfrac{324}{5}e^{-6}$.

故 $P(B|A) = \dfrac{P(BA)}{P(A)} = \dfrac{324}{5e^6 - 575}$.

B16. (1) 当 $x < 0$, $F(x) = 0$;

当 $0 \le x < 1$, $F(x) = \dfrac{x}{2}$

当 $1 \le x < 2$, $F(x) = \dfrac{1}{2}$.

当 $2 \le x < 3$, $F(x) = \dfrac{1}{2} + \dfrac{x-2}{2} = \dfrac{x-1}{2}$.

当 $x \ge 3$, $F(x) = 1$.

(2) $P(x \le 2.5) = F(2.5) = \dfrac{3}{4}$.