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① Discrete random variables

1. a) Discrete
   b) continuous
   c) continuous
   d) Discrete
   e) Discrete
   f) continuous

2. a) $P(X=1.5) = P(c) + P(d) = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$

   b) $P(0.5 < X < 2.7) = P(c) + P(d) + P(e) = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{2}$

   c) $P(0 \le X < 2) = P(a) + P(b) + P(c) + P(d) = 4 \times \frac{1}{6} = \frac{2}{3}$

   d) $P(X > 3) = 0$

3. X: random variable that ~~[illegible]~~ are the numbers of defective computers purchased by school. $X = \{0; 1; 2\}$

$P(X=0) = \frac{3C0 \times 17C2}{20C2} = 0.71$

$P(X=1) = \frac{3C1 \times 17C1}{20C2} = 0.268$

$P(X=2) = \frac{3C2 \times 17C0}{20C2}$

4. X: number of components that meets the specification $X = \{0; 1; 2\}$

$P(X=0) = (1-0.95) \times (1-0.98) = 0.001$

$P(X=1) = 0.95 \times (1-0.98) + (1-0.95)\, 0.98 = 0.06$

$P(X=2) = 0.95 \times 0.98 = 0.931$

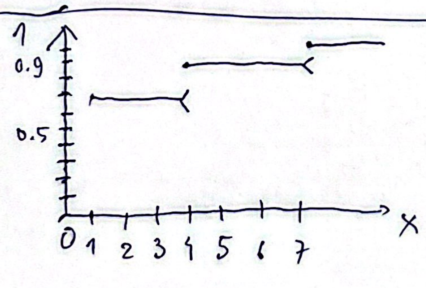
5. $f(x) = P(X = x)$

$(15) = P(X = 15) = 0.6$

$(5) = P(X = 5) = 0.3$

$(-0.5) = P(X = -0.5) = 0.1$

6.
$$F(x) = \begin{cases} 0 & \text{if } x < 1 \\ 0.7 & \text{if } 1 \le x < 4 \\ 0.9 & \text{if } 4 \le x < 7 \\ 1 & \text{if } x \ge 7 \end{cases}$$



We know that, $F(x) = P(X \le x) = \sum_x P(X$

So probability mass function of X,

$P(X = x) = 0.7$ when $x = 1$

$0.9 - 0.7 = 0.2$ when $x = 4$

$1 - 0.9 = 0.1$ when $x = 7$

Then, pmf of X,

X	1	4	7
P(X=x)	0.7	0.2	0.1

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