

M 362K Post-Class Homework 7

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3-13

From the cumulative probability distribution, we can calculate the probability distribution as follows:

x	-2	0	1	3	5	6
Pr(X=x)	0.12	0.11	0.25	0.28	0.18	0.06

$$\therefore E[X] = -2 * 0.12 + 0 * 0.11 + 1 * 0.25 + 3 * 0.28 + 5 * 0.18 + 6 * 0.06 = 2.11$$

3-14

The probability distribution and the insurance payment is listed as follows:

x	1	2	3	4	5
Pr(X=x)	$\frac{1}{3}$	$\frac{4}{15}$	$\frac{1}{5}$	$\frac{2}{15}$	$\frac{1}{15}$
Payment	100	200	300	325	350

$$\text{According to the table above, } E[\text{Payment}] = \frac{1}{3} * 100 + \frac{4}{15} * 200 + \frac{1}{5} * 300 + \frac{2}{15} * 325 + \frac{1}{15} * 350 = \frac{640}{3} = 213.33$$

Therefore the answer is (D)

3-15

Set $F(M = 2) = x$

Then the probability distribution is listed as below:

m	0	1	2	3	4
F(M=m)	0	0.2	$x - 0.2$	$0.8 - x$	0.2

Then we can know $\mu_M = 1 * 0.2 + 2 * (x - 0.2) + 3 * (0.8 - x) + 4 * 0.2 = 2.3$

The above equation gives $x = 0.7$

Therefore $F(M = 2) = 0.7$

3-16

The probability distribution and the insurance payment is listed as follows:

x	1	2	3	4	5
Pr(X=x)	$\frac{1}{3}$	$\frac{4}{15}$	$\frac{1}{5}$	$\frac{2}{15}$	$\frac{1}{15}$
Payment	100	200	300	350	400

According to the table above, $E[Payment] = \frac{1}{3} * 100 + \frac{4}{15} * 200 + \frac{1}{5} * 300 + \frac{2}{15} * 350 + \frac{1}{15} * 400 =$

$$\frac{640}{3} = 220$$

Therefore the answer is (C)

3-21

Let x be the number of distinct partners

Then according to this question

$$E[partner(boy)] = \frac{x}{m} = 13.5$$

$$E[\textit{partner}(\textit{girl})] = \frac{x}{n} = 3.5$$

$$\therefore 13.5m = 3.5n$$

$$\frac{m}{n} = \frac{3.5}{13.5} = \frac{7}{27}$$

Therefore the ratio between boys and girls is 7:27