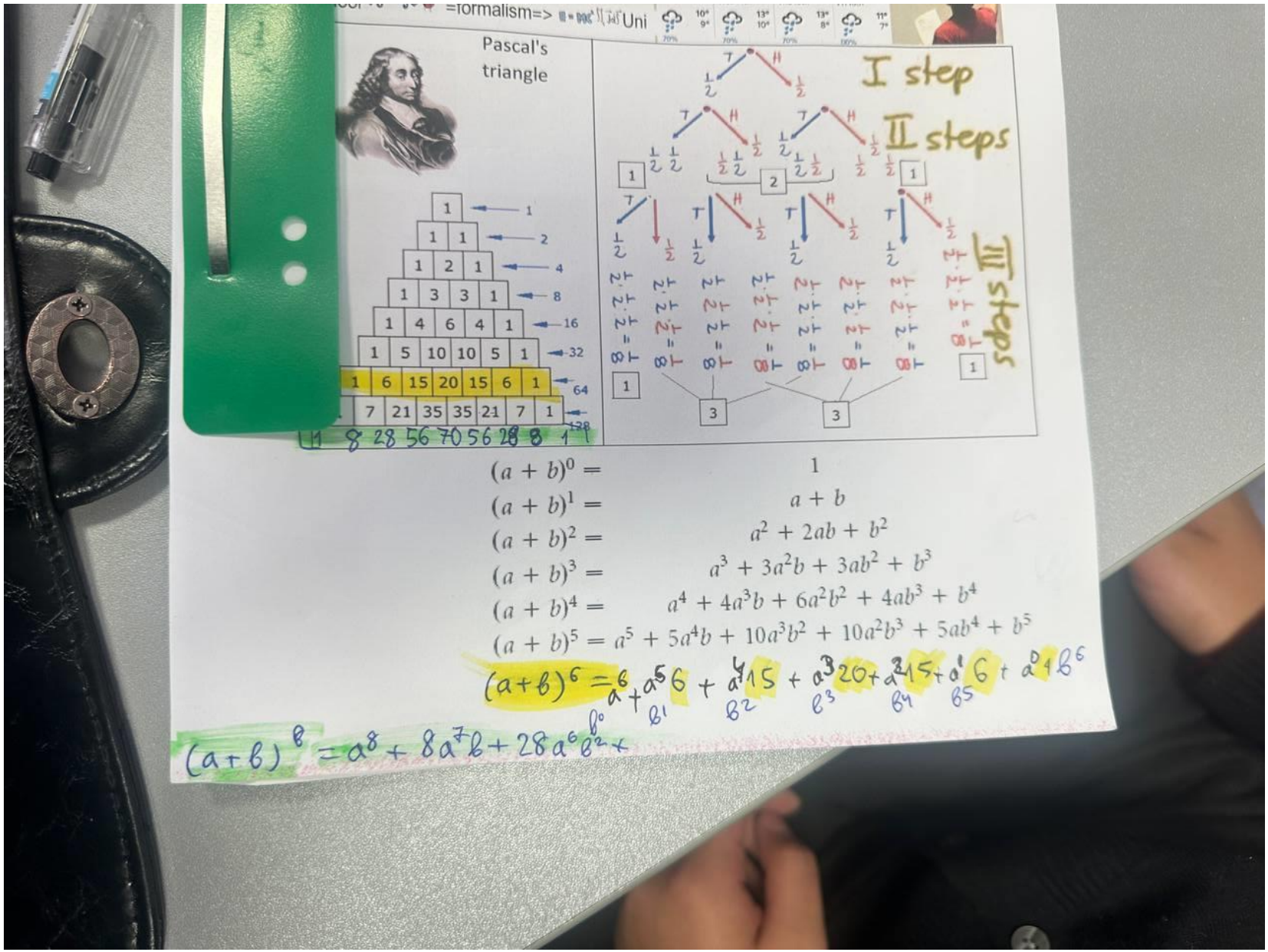
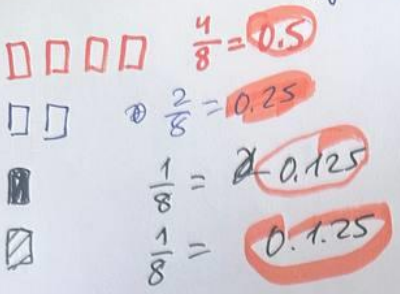

Pascal's triangle
I step
II steps
III steps
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1
1 8 28 56 70 56 28 8 1
$(a+b)^0 = 1$
$(a+b)^1 = a+b$
$(a+b)^2 = a^2+2ab+b^2$
$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$
$(a+b)^4 = a^4+4a^3b+6a^2b^2+4ab^3+b^4$
$(a+b)^5 = a^5+5a^4b+10a^3b^2+10a^2b^3+5ab^4+b^5$
$(a+b)^6 = a^6 + a^5b + a^4b^2 + a^3b^3 + a^2b^4 + ab^5 + b^6$
$(a+b)^8 = a^8 + 8a^7b + 28a^6b^2 +$

1.75 guess

Avg nom ? to 1st que know cards



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

$\frac{2}{8} = 0.25$

$\frac{1}{8} = 0.125$

$\frac{1}{8} = 0.125$

1) 1 · 0.5 → Right 5

2) 2 · 0.25 → Right 2

3) 3 · 0.125 → Right 12

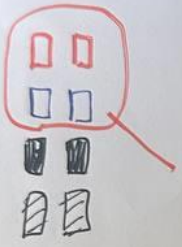
3) 3 · 0.125 → Right 12

0.5
0.5
0.375
0.375

1.75 Question per card.

1.625

2 guess



1) Black? No

2) Red? No

Blue

2 questions

Red card $\frac{4}{8}$

blue card $\frac{2}{8}$

black card $\frac{1}{8}$

grid card $\frac{1}{8}$

$\log_2\left(\frac{1}{0.5}\right) = \log_2(2) = 1$ ($2^1 = 2$)

$\log_2\left(\frac{1}{0.25}\right) = \log_2(4) = 2$

$\log_2\left(\frac{1}{0.125}\right) = \log_2(8) = 3$

$\frac{4}{8} \times 2 + \frac{2}{8} \times 2 + \frac{1}{8} \times 2 + \frac{1}{8} \times 1$

$1 + 0.5 + 0.25 + 0.125$

$= 1.875$

$$\sum_{i=1}^{4} P_i(x) \cdot \log_2\left(\frac{1}{p(x)}\right)$$

Entrophy Shannon

8.8

Average Number of Questins

1 Quest 2q 3q

$$\frac{\square\square\square\square\ \square\square\ \square\blacksquare}{8} = \frac{\overset{4}{1\cdot 4}\quad \overset{4}{2\cdot 2}\quad \overset{6}{3\cdot 2}}{8} = 1.75$$

Entrophy

$14 \,|\, 8$
$8 \quad 1.$
60

$$\frac{5 + \overset{(3\times 2)}{6}}{8} = 1{,}375$$

1.625

$\square\square\square\square\square$ 1st
$\blacksquare$ 2nd
$\square$
$\blacksquare$

$1 \times 5 = 5$
$2 \times 1 \quad 2$
$3 \times 1 \quad 3$
$3 \times 1 \quad 3$

$$\frac{\quad}{8}$$

$\log_2(1.6) = 0.678 = 0.4$

$\frac{13}{8} = 1.625$

0.678

$\frac{5}{8}$ 1) $0.625 \cdot 1$ — $0.625 \cdot \log_2\left(\frac{1}{0.625}\right) =$

$\log_2\left(\frac{1}{0.5}\right) = \log_2(2) = 1$

$\frac{1}{8}$ 2) $0.125 \cdot 2^3$ — $0.125 \cdot \log_2\left(\frac{1}{0.125}\right) = 0.125 \cdot 3$

$\frac{1}{8}$ 3) $0.125 \cdot 2^3$

$\frac{1}{8}$ 3) $0.125 \cdot 2^3$

2.45

$0.625 + 0.25 + 0.25 + 0.25$

$= 1.375$

5%

$5 \cdot 5 = 25$
$6 \cdot 6 = 36$
$7 \cdot 7 = 47$

49

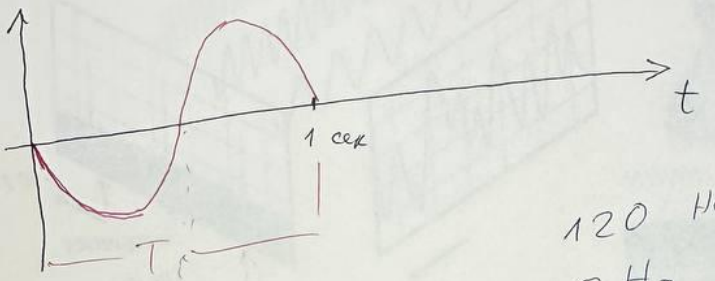
10%

$8 \cdot 8 = 64 = 58$

0.4
0.375
0.375
0.375
1.5

1 Hz mean 60 per minute

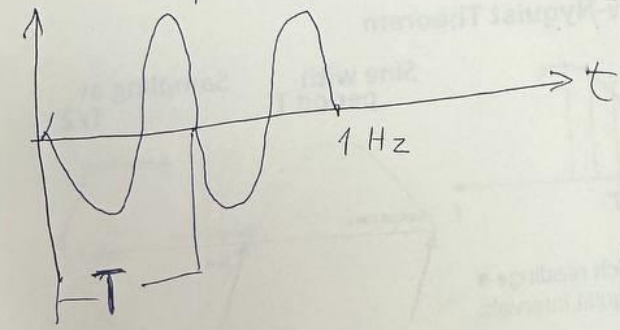
1 Hz · 10^6 T = 1 cek 1 per second



120 Heart Rate

2 Hz

$T = \frac{1}{2}$ cek



180 Heart Rate

3 Hz

$T = \frac{1}{3}$

f T

$f = \frac{1}{T}$

$T = \frac{1}{f}$