$$1-\underbrace{\binom{10}{9}}_{10}\cdot\left(\frac{8}{36}\right)^{9}\left(\frac{28}{36}\right)^{10-9}-\underbrace{\binom{10}{10}}_{1}\cdot\left(\frac{8}{36}\right)^{10}\cdot\left(\frac{28}{36}\right)^{10-10}=\boxed{1-10\cdot\left(\frac{8}{36}\right)^{9}\cdot\left(\frac{28}{36}\right)-\left(\frac{8}{36}\right)^{10}}$$

$$=\boxed{\text{Some \#}}$$

HW 6

3 roll two 4-sided dice

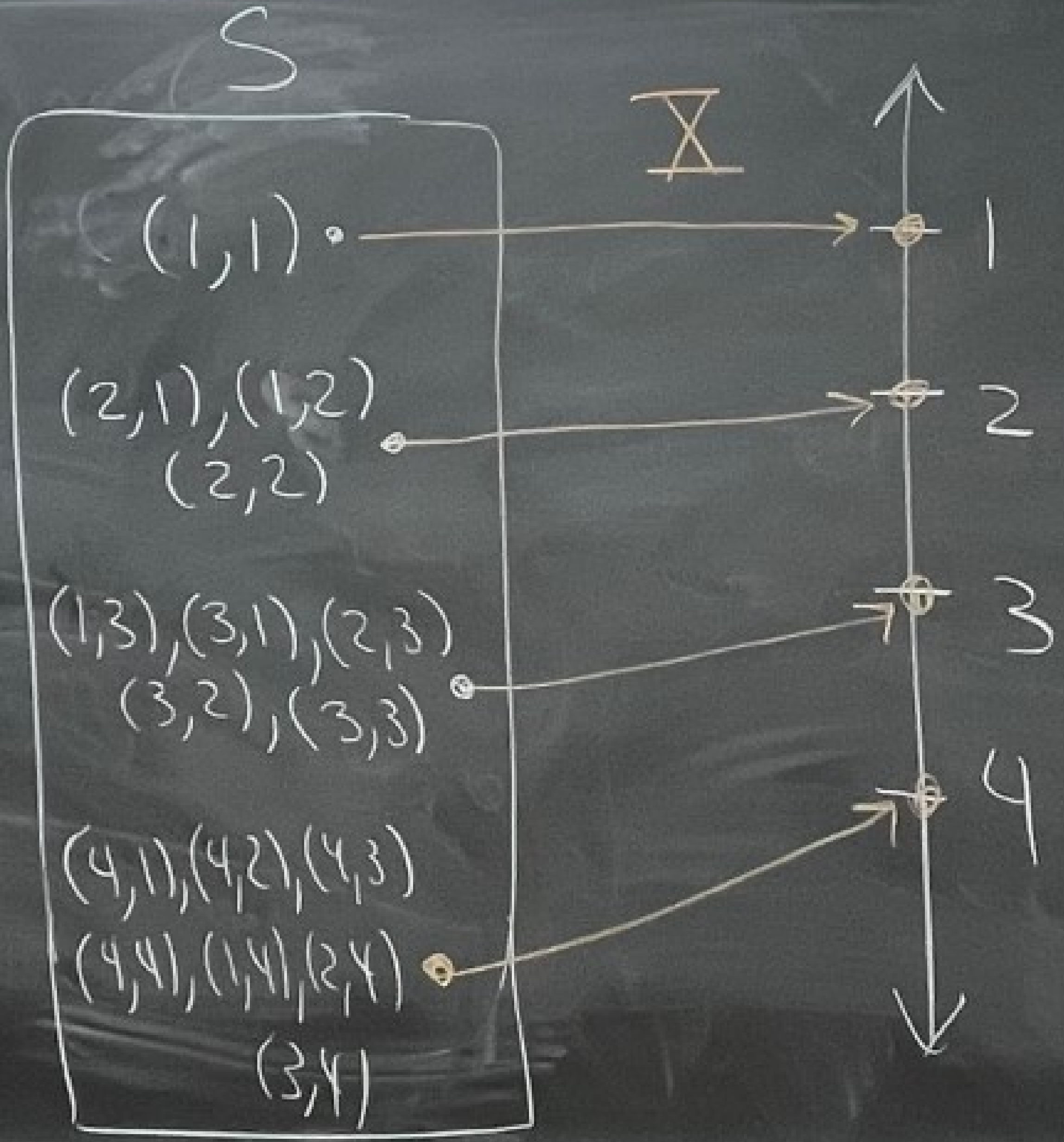
X = maximum of dice

(a) draw X and p

(b) Calculate F

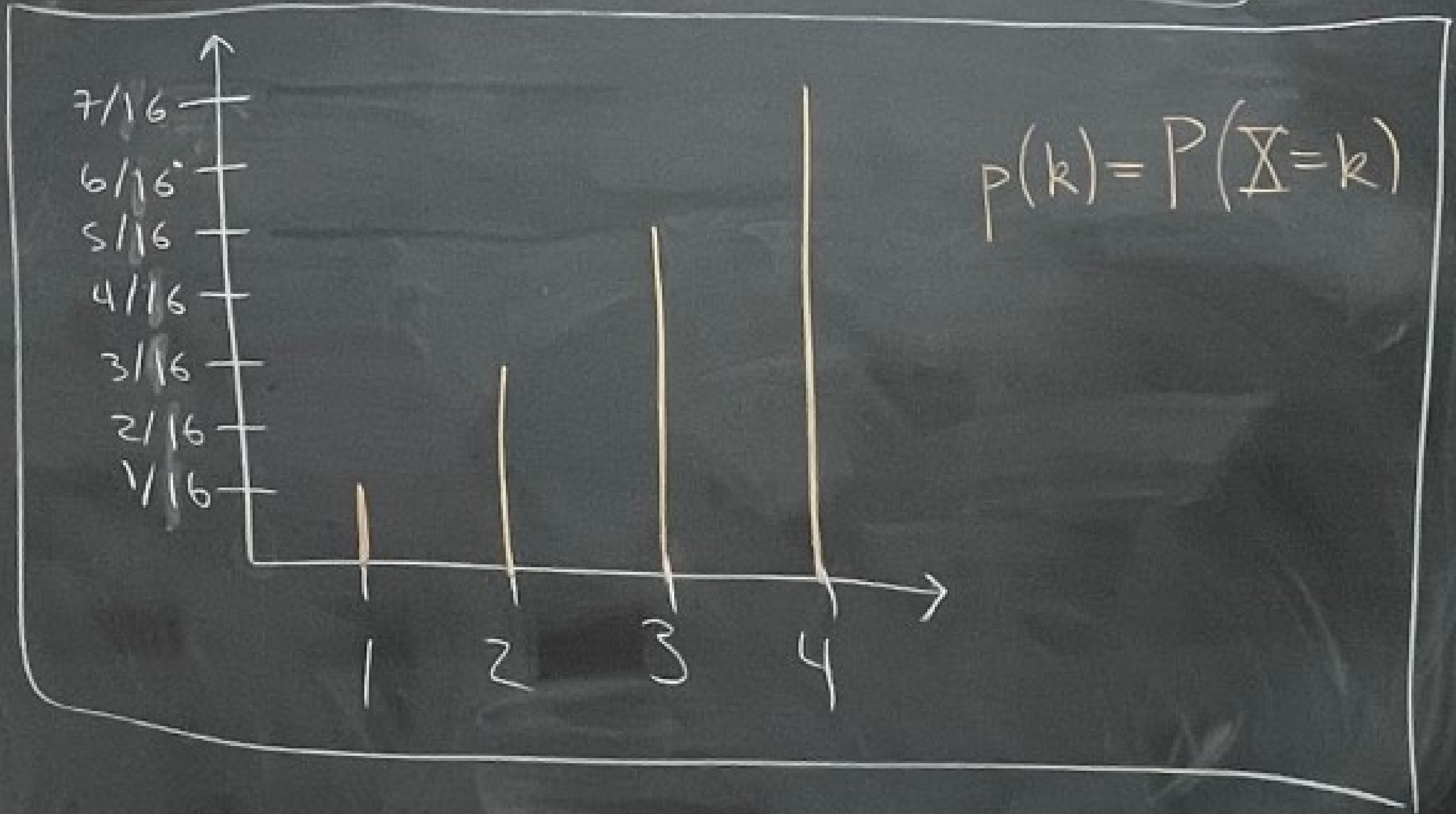
(c) Calculate $E(X)$, $Var(X)$, σ.

(a)



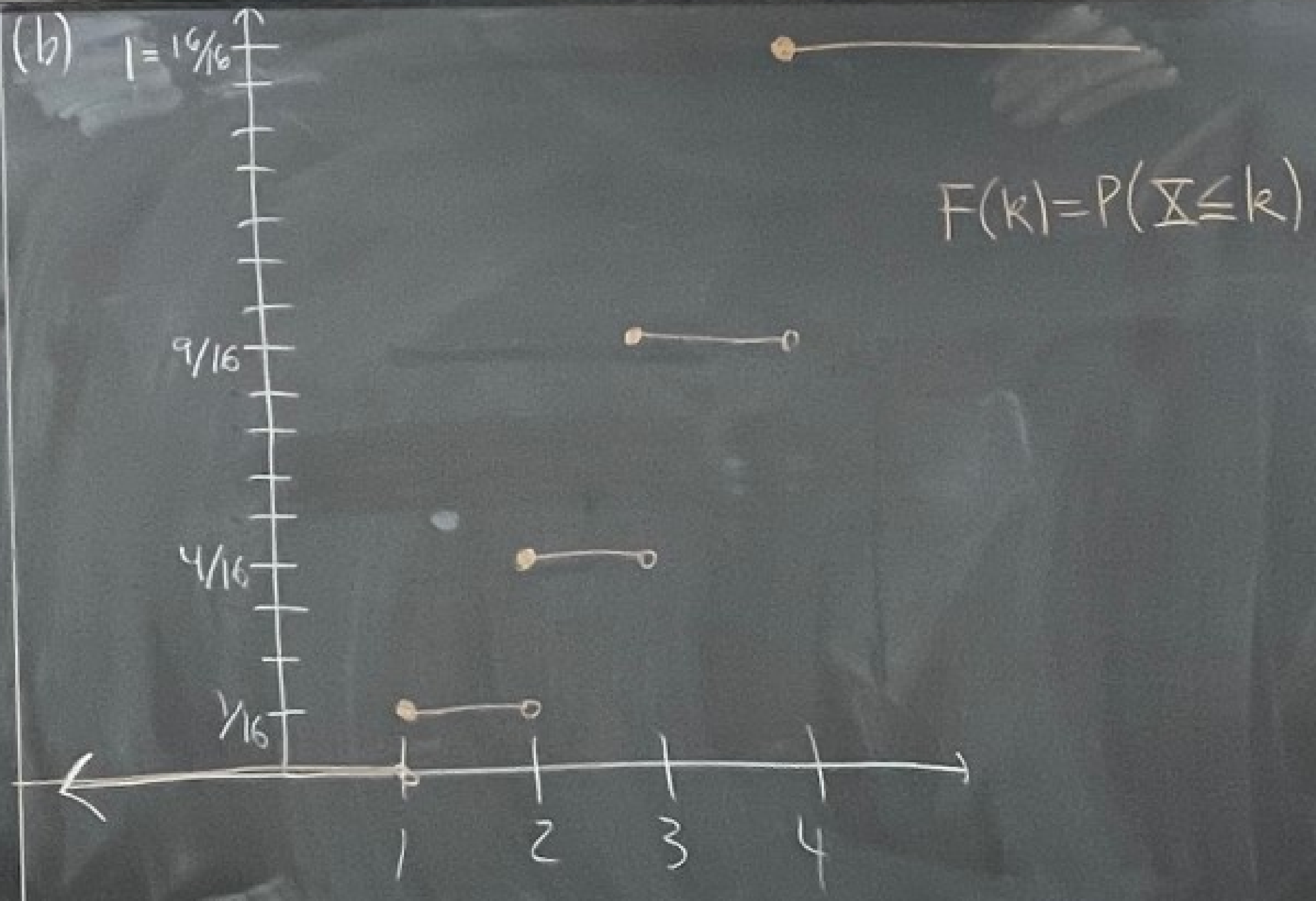
$P(X=1) = 1/16 \qquad P(X=3) = 5/16$

$P(X=2) = 3/16 \qquad P(X=4) = 7/16$



k)

(b)



(c)

$$E[X] = (1)\left(\frac{1}{16}\right) + (2)\left(\frac{3}{16}\right) + (3)\left(\frac{5}{16}\right) + (4)\left(\frac{7}{16}\right)$$
$$= \boxed{50/16}$$

$$Var(X) = E[X^2] - \big[E[X]\big]^2$$

$$E[X^2] = (1)^2\left(\frac{1}{16}\right) + (2)^2\left(\frac{3}{16}\right) + (3)^2\left(\frac{5}{16}\right) + (4)^2\left(\frac{7}{16}\right)$$
$$= 170/16$$

$$Var(X) = \frac{170}{16} - \left(\frac{50}{16}\right)^2 = \boxed{\frac{220}{256}} = \boxed{\frac{55}{64}}$$

$$\sigma = \sqrt{Var(X)} = \sqrt{\frac{55}{64}}$$

$$E[X] = 0\cdot P(X=0) + 1\cdot P(X=1) + 2\cdot P(X=2) + \cdots + 100\cdot P(X=100)$$

$$E[X] = np = 100\left(\frac{7}{16}\right) = \frac{700}{16}$$

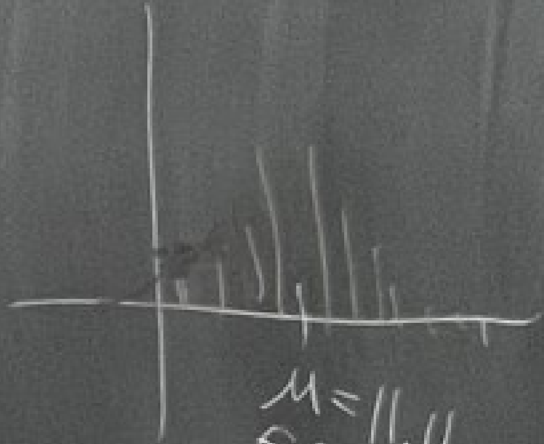
$$P(X=21) = \binom{100}{21}\cdot\left(\frac{7}{16}\right)^{21}\cdot\left(\frac{9}{16}\right)^{100-21} = \frac{100!}{21!\,79!}\cdot\frac{7^{21}}{16^{21}}\cdot\frac{9^{79}}{16^{79}}$$

rolling two 4-sided dice 100 times

X = # times 4 occur as one of the dice

$p = \frac{7}{16} \longrightarrow$ success $= \{(1,4),(2,4),(3,4),(4,4),(4,1),(4,2),(4,3)\}$

$1-p = \frac{9}{16} \longrightarrow$ failure $= \{(1,2),(1,3),(2,1),(2,3),(3,1),(3,2),(3,3),(1,1),(2,2)\}$



$\mu = 11.11$

$E(X)$