

# Sampling Distribution of Sample Means

## ACTIVITY 1: FILL ME IN!

1) Given:  $P = 5, n = 3$

$$\begin{aligned} {}_P C_n &= \frac{5!}{3!(5-3)!} \\ &= \frac{5!}{3!2!} \\ &= \frac{5 \cdot 4 \cdot \cancel{3!}}{\cancel{3!} \cdot 2 \cdot 1} \\ &= \frac{20}{2} \end{aligned}$$

$$\boxed{{}_P C_n = 10}$$

2) Given:  $P = 5, n = 4$

$$\begin{aligned} {}_P C_n &= \frac{5!}{4!(5-4)!} \\ &= \frac{5!}{4!1!} \\ &= \frac{5 \cdot \cancel{4!}}{\cancel{4!} \cdot 1} \end{aligned}$$

$$\boxed{{}_P C_n = 5}$$

3) Given:  $P = 8, n = 6$

$$\begin{aligned} {}_P C_n &= \frac{8!}{6!(8-6)!} \\ &= \frac{8!}{6!2!} \\ &= \frac{8 \cdot 7 \cdot \cancel{6!}}{\cancel{6!} \cdot 2 \cdot 1} \\ &= \frac{56}{2} \end{aligned}$$

$$\boxed{{}_P C_n = 28}$$

4) Given:  $P = 8, n = 7$

$$\begin{aligned} {}_P C_n &= \frac{8!}{7!(8-7)!} \\ &= \frac{8!}{7!1!} \\ &= \frac{8 \cdot \cancel{7!}}{\cancel{7!} \cdot 1} \end{aligned}$$

$$\boxed{{}_P C_n = 8}$$

5) Given:  $P = 10, n = 8$

$$\begin{aligned} {}_P C_n &= \frac{10!}{8!(10-8)!} \\ &= \frac{10!}{8!2!} \\ &= \frac{10 \cdot 9 \cdot \cancel{8!}}{\cancel{8!} \cdot 2 \cdot 1} \\ &= \frac{90}{2} \end{aligned}$$

$$\boxed{{}_P C_n = 45}$$

## ACTIVITY 2: COMPLETE ME

a)  ${}_N C_n = \frac{N!}{n!(N-n)!} = \frac{6 \cdot 5!}{5! \cdot 1!}$

$$\begin{aligned} &= \frac{6!}{5!(6-5)!} \\ &= \frac{6!}{5!1!} \end{aligned}$$

$$\boxed{{}_N C_n = 6}$$