

Warm-up (Part 1)

A dance Committee for Lord Byron needs 5 members. 10 teachers and 12 students want to be on the Committee. How many different Committees are possible if:

- a) exactly 3 students? b) Mr. G (teacher) is the only teacher on the Committee?

$$12^C_3 \times 10^C_2 = 9900$$

$$1^C_1 \times 12^C_4 = 495$$

\uparrow \uparrow
 Mr. G Student

- c) at most 1 student? d) at least 1 teacher?

1st, 4T @ 0s, 5T

$$12^C_1 \times 10^C_4 + 10^C_5$$

$$= 12 \times 210 + 252$$

$$= \underline{2772}$$

(use complement!)

$$\text{total} = 5s 0T \oplus 4s 1T \oplus 3s 2T \oplus 2s 3T \oplus 1s 4T \oplus 0s 5T$$

$$x = \text{total} - 5s 0T$$

$$x = 22^C_5 - 12^C_5 = \underline{25,542}$$

- e) at least 2 teachers?

(use complement!)

$$\text{total} = 5s 0T \oplus 4s 1T \oplus 3s 2T \oplus 2s 3T \oplus 1s 4T \oplus 0s 5T$$

$$y = \text{total} - 5s 0T - 4s 1T$$

$$y = 22^C_5 - 12^C_5 - 12^C_4 \times 10^C_1$$

$$y = \underline{20,592}$$

