

Solving Combinatorics

$${}^n C_2 = 15$$

$${}^n C_r = \frac{n!}{r!(n-r)!}$$

$$\frac{n!}{2!(n-2)!} = 15$$

$$\times 2 \left(\frac{n!}{2(n-2)!} \right) = 15 \times 2$$

$$\frac{n!}{(n-2)!} = 30$$

$$\frac{n \cdot (n-1) \cancel{(n-2)!}}{\cancel{(n-2)!}} = 30$$

$$n(n-1) = 30$$

$$n^2 - n = 30$$

$$n^2 - n - 30 = 0$$

$$(n-6)(n+5) = 0$$

$$\boxed{n=6} \text{ or } \cancel{n=-5}$$

Sec. 2.7

ex. 1 pg. 122

1 teacher, 3 boys + 5 girls in a photograph. Girls must sit together, boys together for a picture.

$\boxed{3B}$ $\boxed{5G}$ $\boxed{+}$

$$\begin{array}{ccc} 3! & 5! & \cdot 1 \\ \underbrace{\hspace{10em}} & & \\ & 3! & \end{array}$$

$$3! \cdot 3! \cdot 5! \cdot 1 = 4320$$