

26. A competition has a first prize, a second prize and a third prize. 10 competitors enter this competition and the 3 prizes are awarded in order of merit.

(i) Find the number of different ways in which these prizes could be won.

Smith and Jones are 2 of the 10 competitors. Find the number of different ways in which the prizes could be won if

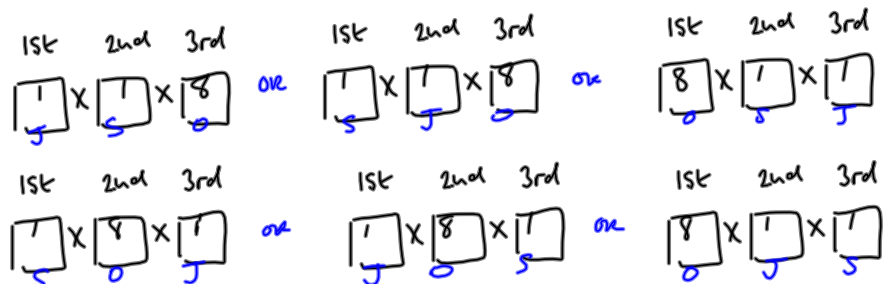
- (ii) neither Smith nor Jones wins a prize
- (iii) each of Smith and Jones wins a prize.

(i) $10 P 3 ?$ $= 10 \times 9 \times 8 = 720$

(ii) neither Smith nor Jones? $= 8 \times 7 \times 6 = 336$

(iii) Smith and Jones wins a prize?
 J = Jones
 S = Smith
 O = one of others

All options



$= 6 (1 \times 1 \times 8) = 6(8) = 48$

Pick specific option \times arrangements of these

$(\begin{matrix} \boxed{1} \\ J \end{matrix} \times \begin{matrix} \boxed{1} \\ S \end{matrix} \times \begin{matrix} \boxed{8} \\ O \end{matrix}) \times (\begin{matrix} \boxed{3} \\ \end{matrix} \times \begin{matrix} \boxed{2} \\ \end{matrix} \times \begin{matrix} \boxed{1} \\ \end{matrix})$
 $= (8)(3!) = 8(6) = 48$