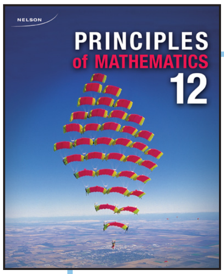


- If you have any difficulty with these solutions, please contact your teacher before continuing.

Page 113, *Your Turn*

We must choose a scoop of chocolate. This can happen in only 1 way, ${}_1C_1$. That leaves 9 flavours from which to choose the remaining 2 flavours. This can be done in ${}_9C_2$ ways. Because we are choosing chocolate AND two other flavours, the Fundamental Counting Principle applies.

$$\begin{aligned}
{}_1C_1 \cdot {}_9C_2 &= \frac{1!}{1!(1-1)!} \cdot \frac{9!}{2!(9-2)!} \\
&= \frac{1!}{1!(0)!} \cdot \frac{9!}{2!(7)!} \\
&= \frac{1}{1(1)} \cdot \frac{9!}{2!(7)!} \\
&= \frac{9 \times 8 \times 7!}{2!(7)!} \\
&= \frac{9 \times 8 \times \cancel{7!}}{2!\,\cancel{(7)!}} \\
&= \frac{9 \times 8}{2 \times 1} \\
&= 36
\end{aligned}$$

Page 115, *Example 3b*

$$T = \frac{5 \cdot 4 \cdot 3!}{2! \cdot 3!} \cdot \frac{4 \cdot 3 \cdot 2!}{2! \cdot 2!}$$

$$T = \frac{5 \cdot 4 \cdot \cancel{3!}}{2! \cdot \cancel{3!}} \cdot \frac{4 \cdot 3 \cdot \cancel{2!}}{2! \cdot \cancel{2!}}$$

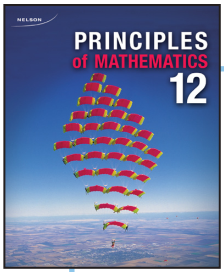
$$T = \frac{5 \cdot 4}{2!} \cdot \frac{4 \cdot 3}{2!}$$

$$T = \frac{5 \cdot 4}{2 \cdot 1} \cdot \frac{4 \cdot 3}{2 \cdot 1}$$

$$T = \frac{20}{2} \cdot \frac{12}{2}$$

$$T = 10 \cdot 6$$

$$T = 60$$



- If you have any difficulty with these solutions, please contact your teacher before continuing.

Page 115, *Your Turn*

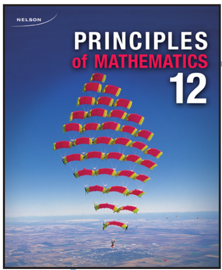
You may know intuitively that the answer to this question is 1 because the team has only four female members and all must be chosen. This can occur only one way. By using combination notation and the Fundamental Counting Principle, it is clear that you are choosing 4 players from the 4 females AND choosing 0 players from the 5 males. This accounts for all nine people on the team as well as the action of choosing four players.

$$
\begin{aligned}
{}_4C_4 \cdot {}_5C_0 &= \frac{4!}{4!(4-4)!} \cdot \frac{5!}{0!(5-0)!} \\
&= \frac{4!}{4!(0)!} \cdot \frac{5!}{0!(5!)} \\
&= \frac{4!}{4! \cdot 1} \cdot \frac{5!}{1 \cdot (5!)} \\
&= \frac{\cancel{4!}}{\cancel{4!}} \cdot \frac{\cancel{5!}}{(\cancel{5!})} \\
&= 1 \cdot 1 \\
&= 1
\end{aligned}
$$

Page 117, *Your Turn (a)*

Answers will vary for these solutions. Contact your teacher to confirm that your answer is correct.

a. Possible Solution: Shelby's solution is more efficient. She used fewer calculations to arrive at the same answer.



- If you have any difficulty with these solutions, please contact your teacher before continuing.

Page 125, *Your Turn*

Total of five card hands that contain at most one black card

= (Total of all five-card hands) – (Hands of 0 red and 5 black) – (Hands of 1 red and 4 black) – (Hands of 2 red and 3 black) – (Hands of 3 red and 2 black)

$$= \binom{52}{5} - \binom{26}{0}\binom{26}{5} - \binom{26}{1}\binom{26}{4} - \binom{26}{2}\binom{26}{3} - \binom{26}{3}\binom{26}{2}$$

$= 454\ 480$