

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

Page 82, Question 6a

$$\begin{aligned} & \frac{n!}{(n-1)!} \\ &= \frac{n(n-1)!}{(n-1)!} \quad \checkmark \\ &= \frac{n \cancel{(n-1)!}}{\cancel{(n-1)!}} \\ &= n \quad \checkmark \end{aligned}$$

Page 82, Question 6d

$$\begin{aligned} & \frac{n!}{(n-3)!} \\ &= \frac{n(n-1)(n-2)(n-3)!}{(n-3)!} \quad \checkmark \\ &= \frac{n(n-1)(n-2)\cancel{(n-3)!}}{\cancel{(n-3)!}} \\ &= n(n-1)(n-2) \quad \checkmark \\ &= n(n^2 - 2n - 1n + 2) \\ &= n(n^2 - 3n + 2) \\ &= n^3 - 3n^2 + 2n \quad \checkmark \end{aligned}$$

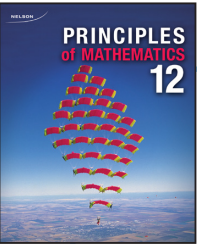
Page 87, Your Turn

a. $n + 3 \geq 0$, so the values of n that make $(n + 3)!$ defined are $n \geq -3$. ✓

b. numerator: $n \geq 0$; so, the values of n that make $(n)!$ defined are $n \geq 0$.

denominator: $n + 2 \geq 0$; so, the values of n that make $(n + 2)!$ defined are $n \geq -2$. ✓

Both expressions must be defined; so, the restriction that satisfies both is $n \geq 0$. ✓



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Page 80, *Your Turn*

$$\frac{(n + 4)!}{(n + 2)!} = 6$$

$$\frac{(n + 4)(n + 3)(n + 2)!}{(n + 2)!} = 6$$

$$\frac{(n + 4)(n + 3)\cancel{(n + 2)!}}{\cancel{(n + 2)!}} = 6 \quad \checkmark$$

$$(n + 4)(n + 3) = 6$$

$$n^2 + 7n + 12 = 6$$

$$n^2 + 7n + 6 = 0 \quad \checkmark$$

$$(n + 1)(n + 6) = 0$$

$$n = -1, -6 \quad \checkmark$$

Verify the solutions:

Left Side	Right Side
$\frac{(n + 4)!}{(n + 2)!}$	6
$\frac{(-1 + 4)!}{(-1 + 2)!}$	
$\frac{(3)!}{(1)!}$	
6	



Left Side	Right Side
$\frac{(n + 4)!}{(n + 2)!}$	6
$\frac{(-6 + 4)!}{(-6 + 2)!}$	
$\frac{(-2)!}{(-4)!}$	
undefined	

Because $n = -6$ results in numbers that are not natural numbers it is not an acceptable solution. Therefore, $n = -1$ is the only solution. 