Proof That the Sum of the First Five Numbers Equals 15

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1 Question

We want to prove that the sum of the first four natural numbers equals 10:

$$1 + 2 + 3 + 4 + 5 = 15$$

2 Proof

We compute the sum step by step:

$$\begin{aligned}
1 + 2 + 3 + 4 + 5 &= (1 + 2) + 3 + 4 + 5 && \text{(Group the first two terms)} \\
&= 3 + 3 + 4 + 5 && \text{(Compute } 1 + 2 = 3\text{)} \\
&= (3 + 3) + 4 + 5 && \text{(Group the next two terms)} \\
&= 6 + 4 + 5 && \text{(Compute } 3 + 3 = 6\text{)} \\
&= 10 + 5 && \text{(Compute } 6 + 4 = 10\text{)} \\
&= 15. && \text{(Compute } 10 + 5 = 15\text{).}
\end{aligned}$$

3 Conclusion

Thus, we have shown through step-by-step addition that:

$$1 + 2 + 3 + 4 + 5 = 15$$