

Induction – Q4 [Practice/E] (18/6/23)

$$2 + 4 + 6 + \dots + 2n = n(n + 1)$$

Solution

Result to prove: $\sum_{r=1}^n 2r = n(n + 1)$

[Show that the result is true for $n = 1$]

Now assume that the result is true for $n = k$, so that

$$\sum_{r=1}^k 2r = k(k + 1)$$

Then $\sum_{r=1}^{k+1} 2r = k(k + 1) + 2(k + 1) = (k + 1)(k + 2)$

$$(k + 1)([k + 1] + 1)$$

[Standard wording]