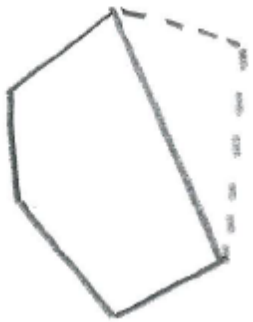
Induction – Q30 [Practice/M] (18/6/23)

The sum of the interior angles of a convex n-sided polygon is $180(n-2)$

Solution

When $n = 3$ (the smallest possible value), the result is true, as the interior angles of a triangle add up to 180°.

Now assume that the result is true for $n = k$, so that the total of the interior angles is $180(k - 2)$.



The diagram shows the case $k = 5$, but applies more generally.

By adding another triangle, n has increased by 1, and the total of the interior angles has increased by 180.

Thus the total for $k + 1$ sides is $180(k - 2) + 180 = 180(k - 1)$

$= 180([k + 1] - 2)$

[Standard wording, but starting at $n = 3$]